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VOLUME IV, NUMBER 1 JANUARY, 1943

TRADITION AND INNOVATION IN FIFTEENTH CENTURY ITALY[1]

"IL PRIMATO DELL' ITALIA" IN THE FIELD OF SCIENCE

BY DANA B. DURAND

The immediate purpose of this symposium, I take it, is to weigh the elements of tradition against those of innovation in fifteenth-century Italian science and scientific thought. The ultimate purpose is to test in a single instance the validity of the opinion, commonly held since Burckhardt, that the Quattrocento marks a radical break with the Middle Ages and institutes the era of Modern Europe. The instance is crucial, since by general consent science is fundamental to the modern world, and yet Burckhardt in his *Culture of the Renaissance in Italy* ignored it almost completely.

What I shall examine may be described in the phrase "il primato dell' Italia," the primacy claimed for Italy in the field of science, more narrowly in the fields of scientific methodology, cosmology, mathematics and physics. In order to simplify the discussion, I have confined myself largely to the speculative aspects of these disciplines, leaving aside the fruitful work of artists and craftsmen who bridged the gap between the theoretical and the productive or practical activities. The happy union of the hand, the eye, and the mind, which reached its perfection in Leonardo da Vinci, was undeniably a chief glory of Quattrocento Italy, and contributed significantly to the sixteenth-century scientific tradition leading up to Galileo. But the task of assessing the relative importance of the operational and the theoretical contributions to the whole of Quattrocento science must wait for further monographic research.[2]

[1] This paper, together with the critique by Dr. Baron, was delivered at the Renaissance session of the American Historical Association meeting at Chicago, December 29, 1941. At the kind invitation of Dr. Randall, it was submitted to the *Journal of the History of Ideas* as the basis of a symposium on fifteenth-century Italian science. In order not to diminish the force of Dr. Baron's critique, it was decided to publish the paper substantially as given at Chicago, confining revision chiefly to matters of detail.

[2] The fundamental work on this subject is Leonardo Olschki, *Geschichte der neusprachlichen wissenschaftlichen Literatur:* I, *Die Literatur der Technik und der angewandten Wissenschaften vom Mittelalter bis zur Renaissance* (Heidelberg,

Without attempting to set up a rigorous theory of historical process, I should like to indicate the methodological considerations which have governed the preparation of this paper. I make use of organic analogies without insisting upon them, since the application of biological categories to the study of intellectual history can hardly be carried out with full consistency.

In general, by tradition one may understand the persistence of a germ plasm, a tissue of forms, categories and habits of speculative thought, in this case the medieval structure of Christian dogma, the scholastic method, the Aristotelian-Ptolemaic cosmos, peripatetic metaphysic and science, etc. Tradition also includes the highly diversified operational skills, developed and accumulated over centuries by craftsmen, artists and other technical and manual workers; but these, as I have stated, will not be treated in the present paper.

Innovation would seem to result from two types of cause, the first being internal elaboration of purely traditional substance. The scholastic method, so frequently dismissed as sterile, was in fact peculiarly apt to produce this type of innovation. Its typical instrument, the *questio* form of commentary, by the very fact that it began with a statement—however perfunctory—of the arguments *against* an accepted or orthodox position was bound in certain minds to provoke an interest in the arguments *for* the radical or heterodox position. And in time this speculative interest was likely to ripen into veiled and even overt conviction. This phenomenon, this skeptical and even perverse turning away from established notions, was often the outcome of sheer ennui with the stereotyped arguments of the schools.[3] Masking itself with irony

1919); II, *Bildung und Wissenschaft im Zeitalter der Renaissance in Italien* (Leipzig, 1922); III, *Galilei und seine Zeit* (Halle a. S., 1927). Cf. also the numerous studies of Edgar Zilsel, which are particularly illuminating for the sixteenth- and seventeenth-century phases of the relation between craftsmen and men of science, especially "The Sociological Roots of Science," *American Journal of Sociology,* XLVII (1942), 544–562. The obverse of the "mechanic" scientist is the aristocratic "virtuoso"; cf. Walter E. Houghton, Jr., "The English Virtuoso in the Seventeenth Century," *Journal of the History of Ideas,* III (1942), 51–73, 190–219.—In general for the subjects treated in this symposium the most useful bibliography is that prepared by F. R. Johnson and S. V. Larkey in *Modern Language Quarterly,* II (1941), 363–401.

[3] On the heterodox tendencies of fourteenth-century speculative thought, see the various studies of Konstantin Michalski, especially "La physique nouvelle et les différents courants philosophiques au xiv[e] siècle," *Bulletin international de l'Acadé-*

as a protection against ecclesiastical condemnation, this skepticism flourished in fourteenth-century Paris and Oxford, and persisted in the fifteenth century at Padua and the other Italian universities. In my opinion the critical elaboration of scholastic tradition—particularly in the commentaries on Aristotle—forms the most important component of Quattrocento philosophy and science.

The other chief source of change may be described as full intellectual mutation. This type of change may be purely spontaneous, as in the unanalyzable creative intuition of an individual of genius. It may result from cross-fertilization, an influx of foreign scholars and teachers, or from fresh blood in the form of rediscovered texts and new translations. Finally, mutational change may result from social, political, or economic crises of the type which were so frequent in the lively history of the Italian cities and states. Thus Dr. Baron's studies of Quattrocento humanism and the ideal of civic virtue have shown that fundamental alterations were introduced into the concept of citizenship by Florentine reaction to the threat of Viscontean hegemony.[4]

As an illustration of the interplay of these forces of tradition and innovation, I should like to discuss briefly the special case of cartography, a minor branch of science which has usually reflected quite faithfully the developments taking place in the major branches.[5] In the field of cartography a definite primacy has been claimed for fifteenth- and sixteenth-century Italy, and especially for Florence.[6] Although my own monographic study in fifteenth-

mie Polonaise des Sciences et des Lettres, classe de philologie, classe d'histoire et de philosophie (1927), 158–164.

[4] Of Dr. Baron's numerous studies on Florentine political humanism, see especially "A Sociological Interpretation of the Early Renaissance in Florence," *South Atlantic Quarterly,* XXXVIII (1939), 427–448.

[5] This discussion of cartography is based largely on my monograph *The Vienna-Klosterneuburg Map Corpus of the Fifteenth Century,* 2 vols. (Leiden: E. J. Brill, 1940?) [Publication of the work appears to have been interrupted in May 1940. A copy of the corrected proof has been deposited in the Harvard College Library where it can be consulted by those who are interested.]

[6] On Florentine "primacy," see Roberto Almagià, "Il primato di Firenze negli studi geografici durante i secoli XV e XVI," *Atti della Società Italiana per il Progresso delle Scienze,* XVIII Riunione, (1929), I, 60–80. The priority claimed for the Florentines in creating the *Tabulae Modernae* of Italy, Spain, France, and possibly other regions, has been contested by Father Joseph Fischer, S.J., in his monumental *Claudii Ptolemaei Geographiae . . . Commentatio* (Lugduni Batavorum, Lipsiae, 1932). In any case, the ultimate origin of these maps remains obscure.

century German cartography has suggested certain restrictions to the Italian claim, it has not led me to question the reality of the Italian "primato." The nature of this primacy proves, however, to be very complex. It may be broken down roughly into the following elements: 1) a strong persistence of traditional material, including, a) the stereotyped wheel-map of the so-called T-O form, going back through the Middle and Dark Ages to the *Orbis Terrarum* of Agrippa, and beyond that to the primitive map-frame of the Ionians, b) rudimentary mathematical and astronomical geography embedded in scholastic science, particularly the elements of spherical trigonometry and map projection derived from Ptolemy's *Almagest,* and tables of terrestrial latitudes and longitudes appended to the Latin translations of Arabic astronomical works, c) empirical surveys dating back to the thirteenth and early fourteenth centuries, including both the astonishingly accurate marine charts known as *portolani,* and cruder topographic and hydrographic surveys which had been combined with data from written itineraries to form rudimentary land maps. 2) These traditional elements were transformed in the fifteenth century by a) internal modification and elaboration in the scholastic universities, in the humanistic coteries, and in the professional scriptoria and printing houses, combining all of the traditional elements mentioned above with the newly discovered maps of Ptolemy; b) mutational changes, of which the translation of Ptolemy's *Geographia* by Jacopo d'Angelo in 1406 was by far the most important. The fact that this capital text had been overlooked by the medieval translators may be regarded as one of the momentous accidents of history; its recovery as one of the most notable successes of early scientific humanism. Mutational innovations appear to have been inspired, though not actually produced, by two individuals of genius, the Florentine Toscanelli and the non-Italian Nicholas of Cusa.[7] The progress of

[7] Extravagant claims have been made for Toscanelli as a geographer by G. Uzielli, *La vita e i tempi di Paolo dal Pozzo Toscanelli* (Rome, 1894), *passim.* Cf. the devastating critique of Uzielli by H. Wagner, "Die Rekonstruktion der Toscanelli-Karte . . .," *Nachrichten von der K. Gesellschaft der Wissenschaften zu Göttingen,* phil.-hist. Kl., (1894), 208–312. The precise nature of the famous map which Toscanelli is supposed to have sent to Columbus is still obscure. There is good ground, however, for believing that Toscanelli, at the Council of Florence, was the central figure in a cosmopolitan group of scholars who were interested in compiling modernized maps to supplement the *Geographia* of Ptolemy; cf. J. Fischer, S.J., *Die zur Cusanus-Karte gehörige Descriptio Germaniae Modernae* (Prague, 1936).

cartography was also furthered by a number of critical events in the political and ecclesiastical sphere, of which three may be mentioned: i) the extension of Venetian power on *terra firma* in the first half of the fifteenth century; one consequence of this policy was the practice of making regional and topographic surveys for fiscal and military purposes, which were used for the construction of panoramas and maps. ii) The Council of Florence in 1439 provided a unique opportunity for the meeting of scholars from all parts of Europe, and informal discussion of geographical questions was a natural by-product of such a cosmopolitan gathering. The original inspiration of the so-called Nicholas of Cusa Map, formerly thought to be the first modern map of Central Europe, appears to date from this occasion. iii) A second ecclesiastical event, the great Papal Jubilee in 1450, also brought together a group of non-Italian cartographers, this time in the house of Cardinal Nicholas of Cusa in Rome. The actual drafting of the Cusa Map appears to date from the following year, but there can be no doubt that it represents the end stage of a process which had been going on for nearly a generation. This process, the modernization of Ptolemy, was complex, tentative and obscure. Nevertheless it can be analyzed in sufficient detail to show that the unit of creative innovation at any given point is small, the persistence of tradition great. The rôle of non-Italians, especially Germans and Scandinavians, is in some respects decisive in the primacy of Florentine cartography during the Quattrocento.

I have ventured to discuss the case of cartography in some detail, because it furnishes a sort of paradigm which may be applied to other sciences of broader scope. In the four branches of exact science which I propose to treat in this paper, monographic research has not yet proceeded very far; many of the general statements which I shall be obliged to make in so condensed a discussion may, therefore, prove to be incorrect in the light of future research. The way has been prepared, however, by the work of two great

Father Fischer's conjecture is supported by an interesting discovery of Aubrey Diller, "A Geographical Treatise by Georgius Gemistus Pletho," *Isis*, XXVII (1937), 441–451. The treatise in question is an extension of Strabo; Diller's note raises the question, about which little is known, of the role of Strabo in Renaissance geography. The Latin translation made by Guarino, appears to have been widely known in humanistic circles, but its influence on scientific geography, unlike that of Ptolemy, cannot be described as mutational.

scholars, Pierre Duhem[8] and Lynn Thorndike[9], and with their guidance we shall not go far astray. It is, indeed, only fair to point out that both these men are animated to some extent by a bias against fifteenth-century Italy, which has led them to minimize its scientific achievement. Duhem, a devout Catholic and a patriotic Frenchman, sought to depreciate the achievement of Galileo—and thereby indirectly to vindicate the condemnation imposed by the Church on the great Florentine—by showing that it came as the end stage of a long tradition of speculative science, originating in the schools of fourteenth-century Paris. Thorndike, on the other hand, seems to have been animated by a certain personal antipathy toward the Renaissance. He has systematically run down the scientific achievements of the more famous fifteenth- and sixteenth-century figures, especially when they had been over-praised by contemporary humanists and by modern historians.

The broad findings of Thorndike and Duhem have not been effectively challenged, but criticism of detail has seriously restricted some of the latter's sweeping interpretations. The outlines of a new and subtler concept of Italian "primato" are beginning to take shape, a concept in which scholasticism and humanism, Middle Ages and Renaissance, cisalpine and transalpine learning, tradition and innovation assume interdependent instead of opposing rôles.

The most impressive example of this re-interpretation of Italian primacy in the field of science is to be found in the recent article of J. H. Randall, Jr., entitled "The Development of Scientific Method in the School of Padua."[10] Of course the claim of Italian "primato" in this field was nothing new. Raffaello Caverni, at the close of the nineteenth century, spun out the history of the "metodo sperimentale" in Italy through six rambling and not very reliable volumes.[11] Caverni asserted varying degrees of Italian preeminence or priority in experimental science throughout the

[8] Pierre Duhem, *Études sur Léonard de Vinci,* 3 series (Paris, 1906–1913); *Le système du monde,* 5 vols. (Paris, 1913–1917). So far as I am aware, there is still no satisfactory critical study of Duhem's achievement as an historian of science.

[9] Thorndike, *A History of Magic and Experimental Science,* 6 vols. (New York, 1923–1941). For a critical discussion of Thorndike's monumental achievement, see my article "Magic and Experimental Science; the Achievement of Lynn Thorndike," *Isis,* XXXIII (1942), 691–712.

[10] Randall's article appeared in the *Journal of the History of Ideas,* I (1940), 177–206.

[11] Caverni, *Storia del metodo sperimentale in Italia,* 6 vols. (Florence, 1891–1898).

period since the thirteenth century. Like Duhem, he minimized the absolute originality of Galileo, but, on the other hand, he attributed considerable creative importance to the Quattrocento.

The superiority of Randall's brilliant study over most of its predecessors, lies in the fact that it has no axe to grind—a merit which American scholarship is often able to display. Randall has shown that over a period of more than three centuries (from Pietro d'Abano at the beginning of the fourteenth to Cremonini at the beginning of the seventeenth century) the physicians, the logicians and the physicists of Padua devoted their energies to the perfection of the technique and methodology of scientific investigation. The originality of the Paduan method lay in its combination of the *compositive* and the *resolutive* approach, advancing from effects to causes and regressing from causes to effects. Randall's demonstration of the continuity of this Paduan tradition should kill once and for all the myth that Francis Bacon and René Descartes pulled scientific method out of the hat, like a rabbit. The only question which might be raised is whether this dual method, this combination of "induction" and "deduction," originated and developed exclusively at Padua, or whether it did not undergo a parallel development in the northern schools. Randall's account clearly implies the elaboration of traditional material, especially of Aristotle and Galen. Mutational elements were introduced by the cross-fertilization of disciplines, specifically of medicine and physics[12]—which had been closely associated since the end of the twelfth century—with the elaborate logic of the later Middle Ages. A further cross-fertilization appears to have been introduced through the passage of Averroistic and nominalistic teachings from Paris to Padua.[13]

[12] The traditional alliance of medicine and physics, which goes back to the 12th century in western Europe, was represented in 15th-century Italy by such names as James of Forli, Giovanni Marliani, Ugo Benzi of Siena. The compatibility of scholasticism and humanism in Renaissance medicine is implied, in the case of Benzi, by the study of Dean P. Lockwood, "Prolegomena to the Life and Works of Ugo Benzi," *Transactions and Studies of the College of Physicians of Philadelphia,* 4th ser., vol. VIII (1940), 125–131.

[13] On Paduan Averroism, see Erminio Troilo, "L'Averroismo Padovano," *Società Italiana per il Progresso delle Scienze,* XXVI Riunione (Rome, 1938), vol. III, fasc. 2, pt. iv, and other articles by a number of scholars, *loc. cit.* The tendency of this group of studies is to emphasize the "modernity" of Paduan Averroism. Troilo has been scornfully attacked by the apologist of Italian humanism, Giuseppe Toffanin, in a letter published in *La Rinascità,* II (1939), 56–72. It is not easy for an outsider to ascertain the nature of the animus which lies beneath this controversy.

During the Quattrocento no mutational advances appear to have taken place, which can be associated with the translation or recovery of new material, or with the creative intuition of a man of outstanding genius. The decisive summations of this slowly evolving line of thought were not achieved until the close of the sixteenth century (Zabarella).

In the other branches of exact science which I shall examine, the threads of a continuous Italian tradition have not been spun together so compactly by modern historians. In the case of the first of these branches—cosmology and astronomy—the developments of the later Middle Ages and the Quattrocento have been interpreted primarily as background for Copernicus. Italian and German historians have sharply contested the primacy for their respective countries in the fifteenth century, and Duhem has claimed it for France in the fourteenth.[14] Germans have read anticipations of Copernicus into the mystico-scientific speculations of Nicholas of Cusa.[15] Italians have been disposed to accept this, and other instances of what might be called the "Cusanus-intrusion" into the Italian "primato," contenting themselves with in-

[14] On fourteenth-century French pre-eminence in the field of astronomy, see Duhem, *Système du monde*, vol. IV, *passim*. Five volumes of this great work, left in MS at the author's death, remain unpublished. Their publication, announced by the firm of A. Hermann, Paris, has presumably been interrupted by the war. Lacking these volumes which continue the history of cosmological theories to Copernicus, we are unable to determine the nature of Duhem's final judgment on fifteenth-century Italian astronomy. It may be inferred from his other writings, however, that this judgment was depreciatory. It is possible that Duhem's views may have been challenged by Ernst Zinner, who is reported to have published an important bibliography and study of Renaissance astronomy. Apparently no copy of this work has been received from Germany.

[15] The magnification of Nicholas of Cusa as a precursor of Copernicus goes back to Giordano Bruno. It was given modern currency by F. J. Clemens, *Giordano Bruno und Nicolaus von Cusa* (Bonn, 1847), and it has been "debunked" with excessive severity by Thorndike, *Science and Thought in the Fifteenth Century* (New York, 1929), ch. VII. *Cf.* Ernst Hoffmann, *Cusanus Studien:* I, *Das Universum des Nikolaus von Cues*, Sitzungsberichte der Heidelberger Akademie der Wissenschaften, phil.-hist. Kl., XX (1930), No. 3. Hoffmann's scholarly study has a *Textbeilage* by Raymond Klibansky giving an accurate transcription of the Cardinal's famous astronomical note on which Clemens built his case for the Copernican anticipation. Other accounts of the Cusan cosmology, both more favorable than that of Thorndike, are to be found in E. Cassirer, *Individuum und Kosmos in der Philosophie der Renaissance* (Leipzig and Berlin, 1927), ch. I, *passim*, and Dietrich Mahnke, *Unendliche Sphäre und Allmittelpunkt* (Halle a. S., 1937), 76–106.

sisting that the learned Cardinal derived his inspiration from contact with Italian scholars, particularly with Alberti and Toscanelli.[16] Moreover, in the case of cosmology, they assert that the decisive influence on Copernicus came, not from the Cusa tradition, but from the teachings of Domenico Maria Novara at Bologna.[17] In the field of empirical astronomy, Italians point with pride to Toscanelli's remarkable observations of Halley's comet in 1456.[18] Germans hail their Regiomontanus who also observed the movements of the comet, though in less detail, and who planned, though he did not live to carry out, the first series of systematic astronomical observations in modern times.[19]

[16] Italian writers have not only accepted but emphasized the originality of Nicholas of Cusa, particularly in the field of philosophy. This tradition of the "Cusanus-intrusion," which has been accepted by most neo-idealist writers, appears to have started with Francesco Fiorentino, *Il Risorgimento filosofico nel Quattrocento* (Naples, 1885).

[17] The Italian case for the influence of Novara on Copernicus is presented by Lino Sighinolfi, "Domenico Maria Novara e Nicolò Copernico," *Studi e memorie per la storia dell' Università di Bologna,* V (1920), 205–231. Sighinolfi suggests that the idea of the earth's motion may have been discussed by Novara and by certain fifteenth-century Italian humanists, but he gives no evidence to support this conjecture.

[18] Uzielli, *op. cit.,* 481, states flatly that Toscanelli was the inspirer of both Cusa and Regiomontanus in the field of cartography, and elsewhere emphasizes his influence on the mathematical speculations of the learned Cardinal. Chapter VI, written by G. Celoria, describes and analyzes in detail the comet observations which Toscanelli noted between 1433 and 1472. Celoria speaks of Toscanelli as "la più gagliarda forza riformatrice del tempo suo" (378), claims that the observations of 1456, "rispetto al loro tempo sono e per la forma e per la sostanza assolutamente nuove ed originali" (344), and blames modern Italian writers for neglecting the memorials of their own astronomical achievement, thereby allowing northerners to claim credit of priority which, in the case of Regiomontanus, is not deserved (378 ff.).

[19] Regiomontanus has recently received his definitive biography at the hand of Ernst Zinner, *Leben und Wirken des Johannes Müller von Königsberg, genannt Regiomontanus* (Munich, 1938). Thorndike, *Science and Thought,* ch. VIII, attempted to deflate the reputations of both Regiomontanus and his master, George Peurbach. But Zinner's biography effectively counters Thorndike's attack. Regiomontanus, as Zinner shows, was obsessed with the idea of reforming the Ptolemaic cosmology. But whether he ever reached the point of abandoning the geocentric theory is doubtful. He made a marginal note "Aristarchus Samius" opposite Archimedes' reference to the possibility that the earth might revolve about the sun (203). Zinner believes it probable that Copernicus, through Domenico Maria Novara, became acquainted with Regiomontanus' project of reforming the

Without attempting to decide in favor of either German or Italian chauvinism, the following restrictions may be applied to the claims of both: a) In astronomy and cosmology the persistence of tradition is very strong throughout the fifteenth century.[20] The basic astronomical material is still substantially that which was current in the Middle Ages, namely Ptolemy's *Almagest,* the standard Arabic tables and texts, the thirteenth-century *Alphonsine Tables* with modifications and revisions from fourteenth-century Paris and Oxford. b) No mutational elements of significance appear to have been introduced in the fifteenth century. There were no major translations or discoveries. The much vaunted revision of the *Almagest,* initiated by George Peurbach and completed by Regiomontanus, was little more than an epitome with few alterations of substance.[21] Both Toscanelli and Regiomontanus professed to be aware that the traditional Ptolemaic-Alphonsine astronomy stood in need of revision, but the observational data and the calculational theory at their disposal were insufficient for the task. It is true that Domenico Maria Novara, noting a discrepancy between Ptolemaic data and observations made in his own day, was led to suggest that terrestrial latitude had actually changed—a surmise which has received unexpected confirmation in our own day. He also attempted a new determination of the inclination of the ecliptic; but similar attempts had been made in France two centuries earlier with results of comparable or superior accuracy.[22] What Copernicus may have learned from his sojourn at Bologna we have no way of

theory of planetary motions, a project which was frustrated by his premature death (204 f.).

[20] The extent to which fifteenth-century astronomical manuscripts reproduce earlier material is apparent from an examination of Zinner's *Verzeichnis der astronomischen Handschriften des deutschen Kulturgebietes* (Munich, 1925). A survey of Italian manuscripts, on the same scale, would yield similar results.

[21] Zinner, (*Regiomontanus,* 60–63), points out, as against Thorndike, that the *Epitome* incorporates material from Arabic astronomy and other sources. Nevertheless, Zinner's account leaves one with the unmistakable impression that the *Epitome* was far from a revolutionary work. It was still based on the translation of Gerard of Cremona, despite the availability of a recent translation by George of Trebizond. Although it served as the textbook of both Copernicus and Galileo, it could hardly have provided the inspiration for a new cosmological system.]

[22] There were a number of independent observations of the inclination of the ecliptic, made by both Arabic and medieval European astronomers. Thus in 1289 Guillaume of St. Cloud, one of the most accurate observers in the West, (he gave the latitude of Paris as 48°50′, accurate to the minute) determined the inclination at 23°34′ (correct value at that time, 23°32.5′).]

knowing, since the scientific legacy of Domenico Maria, which was still extant in the seventeenth century, has disappeared.[23]

If the practical reformation of Ptolemy's astronomy was more in the nature of a wish than a fulfillment, the speculative critique of his cosmology could point to certain tangible achievements. These, however, as Duhem has shown, were chiefly the work of fourteenth-century Paris scholastics. The principal inroad into Ptolemaic-Aristotelian orthodoxy was the theory of the diurnal rotation of the earth.[24] This was a purely speculative cosmology, not founded on any actual observations. It kept the structure of the geocentric system, but inverted its dynamics, immobilizing the sphere of the fixed stars and releasing the earth for a daily spin on its own axis. The theory of the diurnal rotation first lifted its head in Paris about 1300. It was discussed in a multitude of *Questiones* throughout the fourteenth century, usually only to be rejected. The first to espouse it openly was Nicole Oresme, the most imaginative scientific thinker of the later schools, but, bold as he was, even Oresme approached this novelty with coyness and circumspection. There is no evidence that the theory of the diurnal rotation was further elaborated in the fifteenth century by either Germans or Italians. It appears to have been accepted, along with certain other modifications of the Ptolemaic system, in a few Italian circles of the early sixteenth century, but it is not clear whether, through them, it influenced Copernicus.[25]

[23] On the loss of Novara's writings, cf. D. Berti, *Copernico e le vicende del sistema copernicano in Italia* (Rome, 1876), 44, 178. It is possible that a careful search of Italian libraries might result in the discovery of some of Novara's books.

[24] The importance of the theory of the diurnal rotation of the earth was first brought out by Duhem in connection with Nicole Oresme; "Un précurseur français de Copernic: Nicole Oresme (1377)," *Revue générale des sciences pures et appliquées,* XX (1909), 866–873. Oresme's commentary and French version of *De Caelo* (*Du Ciel et du monde*), in which the most radical defense of the theory is to be found, is being edited by A. J. Denomy and A. D. Menut; only Book I has appeared so far, *Medieval Studies,* III (1941), 185–280. A more conservative discussion appears in Buridan's Latin commentary on the *De Caelo,* which has been edited by Ernest A. Moody (to be published in the near future by the Medieval Academy of America). A useful *mise au point,* though by no means a conclusive treatment, is Grant McColley, "The Theory of the Diurnal Rotation of the Earth," *Isis,* XXVI (1937), 392–402.

[25] We are not sufficiently informed on the cosmological views of the Italian contemporaries of Copernicus to know whether they supported the theory of the diurnal rotation. References to the motion of the earth may refer, as in the case of Celio Calcagnini, to a slow rotation of the earth's axis about the celestial poles, or

The other chief departure from Ptolemaic-Aristotelian orthodoxy was the doctrine of a plurality of worlds.[26] The notion that God could have, and actually may have created other worlds outside our own—perhaps infinite in number and extent—was a plaything of the late medieval schools. Rejected by Aristotle, defended by the Epicureans, the plurality of worlds, as Professor Lovejoy has shown, was a logical consequence of the Platonic principle of plenitude. In the late thirteenth century both plenitude and plurality had triumphed, at least officially, over the constitutional restrictions that the peripatetic wing of scholasticism had sought to impose on divine omnipotence. In the fourteenth century, as a result of ecclesiastical pronouncement, the notion of the plurality of worlds was generally, although not universally, accepted. It was passed on to Quattrocento Italy, where it appears to have undergone no significant development. It is possible that Nicholas of Cusa introduced a mutational element through his semi-mystical exaltation of the earth as identical in nature with the "noble" stars. Leonardo da Vinci echoed the Cusan suggestion, and a century later, Giordano Bruno fused it into the Copernican cosmology, deriving from this fusion a new conception of an infinite universe. The origin of Bruno's enthusiastic vision must be traced back, not only to humanistic philosophers of the Quattrocento, but also to those subtle scholastics who had refused to hedge divinity with Aristotle's finite fence.

In mathematics, as in astronomy, the primacy of the fifteenth century has been disputed between Germans and Italians. In the purely utilitarian field of commercial arithmetic, Italy for two centuries had been supreme.[27] Manuscript and printed algorisms and

to some sort of "trepidation" theory, such as had been developed by the Arabs. McColley has recently shown that Giorgio Valla in his *De Expetendis et Fugiendis Rebus Opus* advocated the so-called geo-heliocentric theory, later associated with the name of Tycho Brahe (*Isis*, XXXIII [1941], 312–314). McColley points out that no less than four systems of cosmology competed with the revised Ptolemaic during the sixteenth and seventeenth centuries.

[26] The importance of the "plurality of worlds" is again a discovery of Duhem which has been followed up by McColley; "The Seventeenth Century Doctrine of a Plurality of Worlds," *Annals of Science*, I (1936), 385–430; see also *Speculum*, XII (1937), 386–389 for an account of the same doctrine in St. Bonaventura, Franciscus Mayronis and William Vorilong. On the connection between the plurality of worlds and the principle of plenitude, see A. O. Lovejoy, *The Great Chain of Being* (Cambridge, Mass., 1936), ch. IV.

[27] Italian primacy in mathematics dates from Leonardo Fibonacci. The most

Rechenbücher[28] circulated extensively in Central Europe after the middle of the fifteenth century, but these were usually nothing more than translations and adaptations of Italian models.[29] In less narrowly practical fields, in algebra and trigonometry, the pre-eminence of Italy was directly challenged by German schools, especially the University of Vienna. Regiomontanus is reported to have taken the Italian universities by storm, captivating academic audiences at Padua and Bologna by his humanistic eloquence and his personal charm, quite as much as by his undeniable scientific virtuosity. Regiomontanus attempted to start a mathematical and astronomical correspondence with Giovanni Bianchini, "facile princeps" of contemporary Italian mathematicians.[30] Regiomontanus envisaged an exchange of problems and answers to be based on friendly emulation, but the older Italian was speedily scared away by the precocity of the enthusiastic German.

important recent studies are those of Ettore Bortolotti, especially: "Il primato dell' Italia nel campo della matematica," *Atti della XXVII Riunione della Società Italiana per il Progresso delle Scienze* (Rome, 1939); "L'infinito ed il limite nel Rinascimento italiano," *Bollettino della Unione Matematica Italiana*, I (1939), 275–286.

[28] Perhaps the earliest German *Rechenbuch*, the *Algorismus Ratisponensis* (ca. 1445), appears to have been compiled by Frater Fridericus Amann of Regensburg, through whom the most important documents in the Vienna-Klosterneuburg map corpus have been transmitted (Durand, *op. cit.*, 76). This work, written in a curious hodge-podge of Latin and German, bears the evidence of derivation from an Italian model.

[29] The numerous commercial arithmetics of 15th-century Italy perhaps deserve a more thorough study than they have received. Dr. Allan Evans prepared an extensive list of MSS of these algorisms, in connection with his edition of Peglotti's *Practica della Mercatura* (Cambridge, Mass., 1936), but the list has not been published.

[30] The correspondence of Regiomontanus with Bianchini and other contemporary mathematicians was edited by Maximilian Curtze (Abhandlungen zur Geschichte der mathematischen Wissenschaften, XII, XIII, Leipzig, 1902). Cf. also S. Magrini, *Johannes de Blanchinis ferrariensis e il suo carteggio scientifico col Regiomontano (1463–4)*, Atti e Memorie della Deputazione Ferrarese di Storia Patria, vol. XXIII, (1917), fasc. 3. There is no satisfactory account of Bianchini's scientific work, either as astronomer or as mathematician. Zinner (*Regiomontanus*, 69–80) presents the Italian as distinctly outclassed, and definitely disturbed by the trend of the correspondence. There is no reason, however, for inferring that Bianchini was incompetent. Apparently his scientific equipment derived in large measure from the tradition of the fourteenth-century Paris and Oxford schools (*infra*); cf. L. A. Birkenmajer, *"Flores Almagesti.* Ein angeblich verloren gegangener Traktat Giovanni Bianchini's. . . ." *Bulletin de l'Académie des Sciences de Cracovie*, cl. des sci. math. et naturelles, série A (1911), 268–278.

In the purely speculative field, the Quattrocento has sometimes been credited with the origins of modern mathematicism, that is the philosophical and scientific approach to the study of natural phenomena through precise quantitative measurement and specification. E. A. Burtt has attempted to show that mathematicism was born of Neo-Pythagorean metaphysics, developed by Nicholas of Cusa, and transmitted through Copernicus and the sixteenth-century Italian school to the age of Galileo, Kepler and Descartes.[31] Burtt's thesis has been challenged by Edward W. Strong, who opposes to the vague mathematics of the theorists those solid operational techniques which were being developed by practical men through the study of Euclid. Both Strong and Burtt, it seems to me, present complementary rather than contradictory theses, and both have weakened their cases by ignoring the background of medieval mathematics.

Indeed, the internal elaboration of traditional mathematical material had proceeded rapidly in thirteenth- and fourteenth-century Oxford and Paris.[32] Metamathematics—the hunch that mathe-

[31] Besides Burtt, *The Metaphysical Foundation of Modern Physical Science* (New York, 1927) and Strong, *Procedures and Metaphysics . . .* (Berkeley, California, 1936), see Mahnke, *Unendliche Sphäre und Allmittelpunkt,* especially ch. IV, "Die Renaissance des neuplatonischen Pythagoreismus." A controversy of a slightly painful nature has arisen between Mahnke and Walter Pagel, who reviewed *Unendliche Sphäre* in *Isis,* XXX (1930), 121–124. The controversy hinges over the rôle of Jewish influence, especially Ibn Gabirol and the *Cabala,* in the formation of 17th-century mathematical mysticism; Mahnke, "Origins of mathematical mysticism, Erwiderung," with reply by Pagel in *Isis,* XXXII (1940), 131–133; this number of *Isis* has been held in German-occupied Belgium, but a copy of the proof may be consulted at the office of Dr. George Sarton, 189 Widener Library, Cambridge, Mass. See also Ernst Cassirer, "Mathematische Mystik und mathematische Naturwissenschaft," *Lychnos* (Stockholm, 1940), 248–265.

[32] The study of fourteenth-century Paris and Oxford mathematics has scarcely begun. Carl B. Boyer, *The Concepts of the Calculus* (New York, 1939), 69–79, is an interesting beginning, but merely emphasizes the need for editions and special studies of 14th-century texts. An important step in this direction is the project of Marshall Clagett to edit the *Calculationes* of Richard Suiseth. The studies of Ernest A. Moody in late medieval logic should bring out the importance of the new quantitative approach developed at Oxford and transplanted to fifteenth-century Italy. I have prepared a transcription of Oresme's *Questiones super Geometriam Euclidis* from the sole MS, Vat. lat. 2225, ff. 90r–98v, and propose to publish it in connection with his chief mathematico-physical work, the *Tractatus de Configuratione Qualitatum.* This work is discussed in my article, "Nicole Oresme and the Medieval Origins of Modern Science," *Speculum,* XII (1941), 167–185, which contains addi-

matics was the key to all natural knowledge, the pattern of philosophical certitude—had haunted the imagination of Grosseteste, Roger Bacon and Oresme, and the gap between Oresme and Nicholas of Cusa is very small. Boethian arithmetic and Euclidean geometry had been extended as purely speculative disciplines by Thomas Bradwardine. The classical problems of squaring the circle and duplicating the cube had fascinated the scholastics a century before Cusanus incurred the scorn of Regiomontanus for wasting his time in these aberrations. A set of *Questiones* on the Geometry of Euclid by Nicole Oresme, which I discovered in the Vatican Library, confirms the impression that Pythagorean topics, such as incommensurability, irrationality, and proportionality, were actively, if naively, discussed in the fourteenth-century schools. Theories of the mathematical and physical continuum, of potential and actual infinity, of infinitesimals and infinite series, of fractional exponents[33] and functional variations were elaborated with great subtlety, though not always with strict mathematical rigor, at Paris and Oxford.

Fifteenth-century Italian mathematical theory continues this late scholastic tradition, without apparently introducing any mutational advances.[34] The chief mathematicians of the early Quat-

tional references on the points raised in the present paper. In addition to these references, I might mention Hubert Élie, *Le traité "De l'Infini" de Jean Mair* (Paris, 1937), text and French translation, one of the most important contributions to our slender body of materials for late medieval mathematical philosophy. One of the outstanding *desiderata* in this field is a study of Bradwardine, and modern editions of his *Arithmetica Speculativa* and *Geometria Speculativa*. The mathematical conceptions of both Roger Bacon and his master Grosseteste deserve additional study; in the case of the latter, the projected edition of *Opera Omnia* together with the work of S. H. Thompson should eventually extend our knowledge of his mathematicism and his so-called "Lichtmetaphysik," a term coined, I believe, by Ludwig Baur, and criticized by A. Birkenmaier in his *Études sur Witelo*, Bulletin international de l'Académie Polonaise, cl. de philol., cl. d'hist., et de philos. (1919–1920), 354–360. Miss Mary Welborn is preparing an edition of Grosseteste's *Computus*.

[33] The first use of fractional exponents is ordinarily credited to Oresme; I understand, however, that an equivalent procedure has been noted in the writings of the English philosopher Dumbleton (by Ernest A. Moody). It also appears in Bianchini's *Flores Almagesti*, referred to above.

[34] P. O. Kristeller and J. H. Randall, Jr., "The Study of the Philosophies of the Renaissance," *Journal of the History of Ideas*, II (1941), 449–496 discuss, in a very suggestive and stimulating fashion, the problem of the introduction of 14th-century Paris and Oxford quantitative logical works into 15th-century Italy. They

trocento, Prosdocimo de' Beldomandi and Blasius of Parma, display little originality, being content to mull over procedures of Bradwardine and Oresme.[35] The graphic technique of representing functional variations—the so-called *latitudo formarum*—which had been invented by Oresme, was digested into a school text-book which was used in manuscript and printed form both north and south of the Alps. The Euclid of the fifteenth and early sixteenth centuries, the Euclid of the printing presses, was still that of the crabbed medieval manuscripts, the thirteenth century translation and commentary of Campanus of Novara, based ultimately on the twelfth century version of Adelard of Bath.[36] The medieval lore of proportionality[37] was explored by Renaissance artists and artistic theorists—along with the Arabico-scholastic science of optics or "perspectiva"—as an aid to the formulation of a mathematical canon of beauty.[38]

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suggest that this took place through the agency of Paul of Venice about 1400 (493 f.), and precipitated a controversy over Suiseth's *Calculationes* (Cajetan of Thiene). It is apparent that this topic needs careful investigation, since it is crucial in our judgment of the creative rôle of the Quattrocento scientists. Marshall Clagett in his important monograph on *Giovanni Marliani and Late Medieval Physics* (New York, 1941) shows that Marliani, at least, did not understand the terminology of the 14th-century theory of proportionality, as it had been developed by Bradwardine and others.

[35] Beldomandi and Blasius of Parma are discussed in Thorndike's *History of Magic and Experimental Science*, vol. IV, (New York, 1934), ch. 39, with references to previous literature. But there is need, as Randall and Kristeller point out, for a detailed study of the latter, especially in connection with the controversies over the quantitative vs. the qualitative conception of physics. Despite the careful studies of Wieleitner (referred to in my article on Oresme), the rôle of the *latitudo formarum* in the genesis of analytical geometry has not yet been satisfactorily explored. The treatment of this subject in J. L. Coolidge's *History of Geometrical Methods* (Oxford, 1940), 118, is not sufficient.

[36] A modern edition or at least a critical study of the medieval Euclid is needed. The whole question of the emergence of the concept of geometrical rigor from that of logical rigor, between the fourteenth and the seventeenth century, deserves study by someone who is equally competent in the history of logic and of mathematics.

[37] Proportion, a favorite theme of the later medieval scientists, should be treated in its manifold ramifications: music, art, medicine, astronomy; cf. M. F. Bukofzer, "Speculative Thinking in Medieval Music," *Speculum*, XVII (1942), 165–180. On the connection between astronomy and "proportio," Oresme's *De Commensurabilitate motuum coelestium* is a significant text. Oresme's argument from "incommensurability" as evidence of the uncertainty of astrology, appears again in Pico della Mirandola's critique; Thorndike, *Magic and Experimental Science*, IV, 536.

[38] The influence of medieval proportionality and optics on the development of

The crux of the general case for Italian scientific primacy lies in the instance of speculative physics.[39] Here the opposition has definitely assumed the burden of proof, and with considerable success. Pierre Duhem undertook to show that the modern era of physics began with the fourteenth-century Paris scholastics, especially Buridan and Oresme, who carried out a fundamental critical revision of the peripatetic theory of motion, establishing in its stead the so-called theory of *impetus*. The limitations of this paper do not allow me to discuss the nature of *impetus* physics. I must confine myself to pointing out that, if Duhem is right, the essential steps in preparing the way for Galileo were taken first in fourteenth-century Paris, and later in sixteenth-century Italy by followers of the Paris tradition, the Quattrocento contributing nothing of importance to this process.[40] The only detailed monographic investigation of fifteenth-century Italian physics—Marshall Cla-

art has been treated by Olschki, *op. cit.*, I, 99 ff., 183 ff.; but the subject needs further study. The third book of Ghiberti's *Commentaries* is taken directly from the arabico-medieval *Perspectiva,* and other Quattrocento artists, including Piero della Francesca and Leonardo da Vinci, were familiar with the tradition. I have not been able to consult G. ten Doesschate, *De derde Commentaar van Lorenzo Ghiberti in Verband met de middeleeuwsche Optiek,* Academisch proefschrift, (Utrecht, 1940) [reviewed by K. T. A. Halbertsma in *Bijdragen tot de geschiedenis der geneeskunde,* XXI (1941), 8].

[39] The whole discussion of late medieval and Renaissance physics inevitably centers in the elaboration and critique of Duhem. Clagett's study of Marliani confirms Duhem; Koyré, *Études Galiléennes* (Paris, 1939), qualifies but hardly contradicts. Kristeller and Randall's brief but stimulating discussion of Italian Aristotelianism suggests the lines of a new type of investigation, going beyond, but not necessarily contradicting Duhem. The cross-fertilization of Platonism and Aristotelianism, together with the comprehensive current of Augustinianism in Renaissance scientific thought, appears to be a most promising subject for future investigators. Although not primarily concerned with science, Kristeller's most recent papers suggest lines which the historian of scientific thought may profitably follow: "Florentine Platonism and its Relations with Humanism and Scholasticism," *Church History,* VIII (1939), 201–211; "Augustine and the Renaissance," *International Science* (May, 1941); and his forthcoming monograph on Ficino.

[40] Again an exception might be made for Nicholas of Cusa, whose curious treatise *De Staticis Experimentis* attempts to reduce a wide variety of scientific or pseudo-scientific "experiments" to a simple technique of weighing. The bold conjectural approach of this treatise is reminiscent of the attempt of Oresme to apply his theory of "configuration" to every aspect of natural and supernatural phenomena. It is possible that Cusa may have been more directly influenced by Oresme than has been supposed; cf. Durand, "Nicole Oresme," 184 f.

gett's recent study of Giovanni Marliani—tends to substantiate Duhem's contention. On the other hand, criticism from another source has restricted somewhat the rôle of the impetus theory itself. A. Koyré, in his remarkable *Études Galiléennes,* breaks down the development of the theory of motion into three distinct phases: 1) the peripatetic, which was taken over almost intact in thirteenth-century scholasticism, 2) the late scholastic modification of peripatetic dynamics, the theory of *impetus,* which remained current until the middle of the sixteenth century, 3) the modern phase, based on the renewed studies of Archimedes and on the epoch-making experiments and intuitions of Galileo. The advance marked by each of these last two stages is likened by Koyré to an intellectual mutation, and it is from him that I have adopted that phrase as used in this paper. Koyré, then, substantiates Duhem at least in this respect: he attributes absolute originality to the fourteenth-century Paris school, while implicitly denying it to that of fifteenth-century Italy.

One point, however, may be raised by the advocates of Italian "primato": was not the reception of Archimedes,[41] which made possible the advance beyond the theory of *impetus,* itself the work of the Quattrocento? Must not this reception, like that of Ptolemy's *Geography,* be credited to humanistic science? The answer is fairly clear: unlike the *Geographia,* the bulk of Archimedes' works had been available to the West in the latter part of the Middle Ages —rendered into Latin by the great Dominican translator, William of Moerbeke. On the other hand they had lain almost completely dormant, presumably for the simple reason that they were much too difficult for the scholastics to master. The revival of interest in Archimedes came about in the sixteenth century because the scientific world was ready for it. That revival was not primarily the work of humanists. It is true that a new humanistic translation had been made about 1460 by Jacobus of Cremona, using the same manuscript as William of Moerbeke. That translation was revised by Regiomontanus, who planned to publish it together with the Greek original, but he died before being able to carry out his project; there is no evidence from Regiomontanus' own works that he

[41] The influence of Archimedes in the Middle Ages, though unquestionably slight, might prove on close examination to be more significant than has usually been supposed. Koyré's *Études Galiléennes* throw much light on the rôle of Archimedes in 16th-century physics.

had absorbed the mathematics and physics of Archimedes. The earliest printed editions were based on the Moerbeke text, brazenly plagiarized by Luca Gaurico (1503) and Niccolo Tartaglia (1543). In 1544 the Greek original and the Regiomontanus version of Jacobus' translation were published at Basel. It was not until 1558 that a really satisfactory Latin version became available—the work of Federigo Commandino—and it is from this event, presumably that the "mutation" of physical theory must be dated.

CONCLUSION

The composite balance sheet of the departments of Quattrocento science examined in this paper does not appear to present a clear and uniform Italian advantage. Owing to very broad historical circumstances, especially to the disastrous Hundred Years War coming on top of the Black Death, both England and France undoubtedly slumped in creative vigor. Germany and Italy, enjoying relative peace, order and prosperity, rose in cultural distinction. Bologna, Florence, and Padua, Erfurt, Nuremberg and Vienna replaced Oxford and Paris as the outstanding scientific centers. The diversity of social life, the wide basis of economic prosperity in her cities, permitted Italy to cultivate a greater variety of disciplines and arts than could have been found during the same period in the north. Nevertheless it does not appear that she was uncontestedly supreme in any of those fields examined in this paper. Antecedents in scholastic tradition have been found for nearly all her scientific achievements. Apart from Leonardo da Vinci[42]—who belongs at least in part to the early Cinquecento—and Nicholas of Cusa—who might be described as an "extravagant" of the Quattrocento, and who in any case was not an Italian—the only individual of marked scientific genius was Toscanelli, and it is doubtful whether any mutational advances may be attributed to him, except perhaps in the field of cartography. The increments of classical knowledge through translation and discovery appear to have been slender in the fields of cosmology, mathematics and physics.[43] Cross-fertiliza-

[42] The omission of Leonardo from this discussion may seem somewhat arbitrary. It is justified, however, by the fact that Leonardo can be regarded as a transition figure standing between the Quattrocento and the High Renaissance. His scientific achievement marks the culmination of the late medieval tradition—as Duhem has shown—and at the same time ushers in the brilliant sixteenth-century Italian tradition leading from Benedetti and Cardan to Galileo.

[43] A complete bibliography of Renaissance scientific translations is much to be

tion from abroad, on the other hand, appears to have been highly stimulating, whether this took place through the agency of the Church, the universities, or the patronage of republics or despotisms.

The chief increments of knowledge—or units of innovation—must be classed as internal elaboration of traditional material, rather than as mutations. Some historians who have admitted a partial continuity of subject-matter between medieval and Quattrocento thought have credited the latter with a new approach or spirit, a greater strenuousness, consistency, rigor, a revolutionary insight which amounted to a creation *ex nihilo*, a decisive jump in the course of progress. Claims of originality based upon an intangible spirit are not, of course, subject to absolute proof or disproof. Yet such would seem to be the basis for much of the case for a comprehensive Quattrocento "primato." The evidence, as I see it, points to a qualified estimate, an estimate which satisfies the two cardinal articles of the historian's faith: continuity and spontaneity in historical process. That estimate in this case may be put as follows: the balance of tradition and innovation in fifteenth-century Italy was not so decisively favorable as to distinguish that century radically from those that preceded it, nor to constitute the Quattrocento a unique and unrivaled moment in the history of western thought.

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desired, as a preliminary to a comparison of the relative rôles of humanistic and scholastic translations in Renaissance science. In addition to the humanistic translations already mentioned, the following might also be cited: Ptolemy's *Quadripartitum* by Jacopo d'Angelo; a Latin translation of Archimedes attributed to Aurispa; Theophrastus *De Plantis* by Theodore of Gaza; Aristotle, *Mechanical Problems* by Theodore of Gaza, *Problemata, Historia Animalium* by both Gaza and George of Trebizond, *De Generatione et Corruptione* by Andronicus Callistus, and *De Caelo* by Joannes Argyropulos; Alexander of Aphrodisias, *Problems*, by Theodore of Gaza. In the field of medicine the rediscovery of Celsus *De Medicina* (Guarino, 1426) exerted considerable influence, but could hardly be described as mutational. Indeed, except in the rather restricted fields of botany and geography, it is difficult to see a single instance in which the humanist translators of the Quattrocento provided the basis for a radical scientific advance. On the other hand, a real advance in the field of "natural philosophy" appears to have been introduced through the rediscovery of Lucretius (Poggio, 1417); cf. Max Lehnerdt, *Lucretius in der Renaissance* (Königsberg, 1904); H. Pflaum, *Die Idee der Liebe: Leone Ebreo*, (Tübingen, 1926), 42–45. The influence of Epicureanism, in both its medieval and its Renaissance form, needs further investigation by historians of science.

TOWARDS A MORE POSITIVE EVALUATION OF THE FIFTEENTH-CENTURY RENAISSANCE[1]

By Hans Baron

Recent research in the field of fifteenth-century science, as characterized by Professor Durand, has, we are told, a bearing of tremendous importance on the re-appraisal of the Renaissance. On the one hand—in Durand's words—"since by general consent science is fundamental to the modern world, and yet Burckhardt ignored it almost completely," discussion of fifteenth-century science should be crucial for an evaluation of Burckhardt's picture.[2] On the other hand, most of the publications analyzed in Durand's review have indeed reached the conclusion that little of the originality of thought claimed by Burckhardt for the Renaissance is to be found in fifteenth-century works on science.

These statements, judiciously weighed and qualified by Professor Durand, would at first sight appear to settle definitely the protracted dispute. Many students of the Renaissance may feel today—as they have felt ever since evidence of the inapplicability of Burckhardt's views to fifteenth-century science began to accumulate—that any remaining conflict of opinion is but a rear-guard action between the general historian still clinging to outworn views, and the historian of science, advancing on the strength of fresh discoveries not yet generally assimilated.

Under these circumstances, it is fortunate that the program for this meeting suggests comparisons of fifteenth-century science with the *political* history of the Renaissance.[3] If there is any fallacy in the arguments propounded by Dr. Durand, knowledge gained in other branches of Renaissance research will help to avoid possible pitfalls resulting from limitation to a single field.

[1] This paper is an elaboration of the critical remarks made by the author at the Renaissance session of the American Historical Association meeting at Chicago, December 29, 1941. The points presented are those emphasized in the discussion; but the writer has attempted to make explicit the broader implications of the suggested views, and a number of concrete examples have been added.

[2] Durand, *supra*.

[3] This aspect was represented in the discussion by a paper entitled *The Origins of Modern Balance-of-Power Diplomacy* (*scil.* in the Quattrocento), read by Professor Ernest W. Nelson; published in *Medievalia et Humanistica*, Nov., 1942 (University of Colorado).

I

The tendency to minimize the rôle played by fifteenth-century Italy in the emergence of the modern world is by no means the product of conditions peculiar to the field of science. In political history, when attention is focussed on such elements of the modern state as constitutionally guaranteed civil rights and parliamentary representation on a nation-wide basis, it is difficult to avoid similar negative conclusions about the contribution made by the Renaissance. Bearing in mind such aspects of the modern state, Professor McIlwain in a suggestive lecture before the Mediaeval Academy recently gave it as his opinion that "what Professor Haskins has termed 'the Renaissance of the twelfth century' marks a more fundamental change" and "seems to be on the whole more significant in a perspective of the whole of history, than the later development to which we usually attach the word 'Renaissance.' "[4] Opinions like these, more or less pronounced, are probably held by the majority of present-day historians of English law. They form, for instance, the key-note of R. W. and A. J. Carlyle's six volumes on *Mediaeval Political Theory in the West*.[5] Again, students who place greater emphasis on the growth of administration and on the rise of a trained, nationally-minded bureaucracy frequently trace the pedigree of the modern state from Norman institutions or from the Sicilian monarchy of Frederick II to the jurist-administration of fourteenth-century France, and then to the centralized organization of the absolute monarchy of the seventeenth and eighteenth centuries—without having recourse to any essential contributions derived from the Renaissance.[6]

Yet in the field of political history one can hardly say that this new balance has been established beyond doubt. No sooner are attempts made to reverse what is regarded as an over-emphasis on

[4] Charles H. McIlwain, "Medieval Institutions in the Modern World," *Speculum*, 16 (1941), 277, 279. Cf. an identical statement in his *Constitutionalism, Ancient and Modern* (1940), 60.

[5] See in particular the introductory pages of vol. V (2nd ed., 1938) and VI (1936).

[6] Particularly impressive: A. Brackmann, "Der mittelalterliche Ursprung der Nationalstaaten," *Preussische Akademie der Wissenschaften, Sitzungsberichte* (1936), 128–142; and A. Dempf, *Sacrum Imperium, Geschichts- und Staatsphilosophie des Mittelalters und der politischen Renaissance* (München, 1929), especially 317 ff., 400 ff., 420 ff.

the Renaissance, than some one comes forward to enhance old claims for some priority of fifteenth-century Italy. The way in which discussions have developed in the present meeting reflects this situation. In a vein very different from that of Dr. Durand's criticism of the "*primato dell'Italia* in the field of science," Professor Nelson's contribution from political history has been a vigorous restatement of the thesis—which was virtually that of Ranke—that the state-system of fifteenth-century Italy, composed of Venice, Milan, Florence, Naples, and the Papal State, witnessed the origin of modern balance-of-power diplomacy.[7] In other words, the differences of opinion that embarrass us in our assessment of the Renaissance cut across the border-line between political and intellectual history. In every field of study we are faced with the same problem. In cases without number we have learned to look at modern ideas and institutions as an outgrowth of medieval conditions, which have revealed themselves as indispensable stages in the historical continuity. But at the same time students ask: does this view, however undisputed it may be, force us henceforth to disclaim all that was once deemed the "modern" face and the "precursorship" of the Italian Renaissance? Apparently there are two sides to the picture. In order to understand their complementary truth, a brief methodological digression seems advisable.

When Burckhardt coined the famous phrase that the Italian of the Renaissance was "the first-born among the sons of modern Europe," he certainly was prompted by what we must today call an over-estimate of the direct impact of the Italian Renaissance on the rise of the modern world. He underrated the continuity of medieval conditions in thought, in politics, and in many spheres of life. On the other hand, by the phrase "first-born son of modern Europe" he did not mean simply that the ideas and institutions of the modern world must be traced largely to fourteenth- and fifteenth-century Italy as their historical source. If the words are taken literally, the meaning is that fifteenth-century Italy saw the coming of the first member of a family that subsequently spread throughout the western world—the first specimen of a new species. Burckhardt was thinking of a pattern of society, education, and thought kindred in its sociological and cultural structure to the life

[7] See *above*, note 3.

of the later West, and therefore potentially stimulating to all subsequent generations—the *prototype* far more than the *origin* of the modern world.

The label of "historical significance" we so frequently employ is in fact made to cover two essentially different types of relationship between the past and the present. On the one hand, in our evaluation of past periods we view history as if it were a chain, in which the rôle of each link is merely to bridge the gap between the preceding and following links. But were this the only basis of historical evaluation, our estimate of the import of ancient Greece and Rome for the modern world would be much lower than it is. As a matter of fact, we constantly make use of a second method of historical evaluation, one based on the realization that history is more than a mere chain in which each link has contacts only with its neighbors. For instance, the political and ethical ideals of the Greek city-state may become powerless in the Hellenistic period immediately following, but be revived to historical potency whenever kindred patterns of life emerge—as in Cicero's Rome, in the fifteenth century, in Bacon's England, and possibly in our own day, or in days to come. Ideas of God, the world, space and time, conceived in a religious atmosphere, may later affect the whole fabric of culture and of thought, when kindred thought-patterns become possible in the sphere of science.

These are no doubt truisms. Yet they are easily overlooked. What they imply is that in every given case our attention must be turned both to the rôle of a period as a link in the chain of continuity, and to its potential affinities, in intellectual and social structure, to later periods. This balance of historical emphasis, I think, has recently been neglected in our study of the Renaissance. When it is taken into account, the present antagonism between two apparently irreconcilable schools of thought in the appraisal of the fifteenth century is largely explained.

In the field of political history it is comparatively easy to discern both the merits and the limitations of the two methods. From the outset it is improbable that representative government and a centralized administration—institutions made to answer the specific problems of large nation-states—could have been substantially promoted by the conditions in the small city-republics and tyrannies of fifteenth-century Italy. There is no doubt that the medie-

val assembly of the crown vassals, giving counsel to their king, and the emergence of a new *noblesse de robe* in the national monarchies, were the chief, if not the only, roots of parliamentarism and bureaucracy in England and France. Yet this verdict passed from the perspective of the nation-state leaves unsolved all the questions which might reveal a *structural* kinship of fifteenth-century Italy with those patterns of political and social life which eventually emerged in the modern West.

In the case of the English constitution, increasing knowledge of its preparation throughout the Middle Ages has not removed the gap between "medieval constitutionalism" and "modern constitutionalism." In spite of the importance attached by Professor McIlwain to the institutions and thought of the twelfth and thirteenth centuries, no one has emphasized more strongly than he himself that to find in fifteenth-century England any ideas of republican participation by the people in the government or of active control of the administration by the nation, is to read modern concepts into the medieval context.[8] If it is true that parliamentary institutions and the limitation of despotic monarchy were growing in feudal Europe from the twelfth century onward, it is also true that "medieval constitutionalism," meaning subordination of the king to the law and the imposition of restrictions upon him in matters of jurisdiction, was one thing, while the modern idea "that the members of a free state must be true citizens" by having "a part in its control" (as Professor McIlwain puts it) is another.[9] The latter—modern—notion, which had had its major precedent in the ancient world, played no rôle in England until the middle of the seventeenth century, i.e., after the cataclysm of the Civil War.

Yet in the smaller orbit of the Italian city-state the basic features of modern government by discussion and participation of the citizen in political control appeared as early as the twelfth century. In this milieu, ideas of citizenship that were destined to become, in McIlwain's words, "the commonplace of all political thought in modern times"[10] came to the fore at once when the political thought of the Scholastics was transplanted into the urban

[8] Charles H. McIlwain, *The Growth of Political Thought in the West* (1932), 354 f., 359 ff.; *Constitutionalism, Ancient and Modern*, 91 ff.

[9] *The Growth of Political Thought*, 338.

[10] *Ibidem*, 338.

atmosphere.[11] The fact that these ideas survived throughout the Quattrocento is fundamental for the appraisal of its political and intellectual make-up. Republican freedom and civic intiative, continuing through the 'Age of the Despots,' were forced to develop their full bearing on political ideals and thought in their life-or-death struggle with Renaissance tyranny. It is because of this survival of civic initiative in geographic proximity to bureaucratic-unifying absolutism that the whole range of modern political experience was traversed in the fifteenth century, and this so rapidly that by the end of the century many of the basic tenets of modern political science had matured, and been set forth in works of European scope by Machiavelli and Guicciardini.[12]

Now Professor Nelson has recalled one of the most significant implications of these conditions, namely, that by the second half of the fifteenth century integration and interplay of the Italian states had reached a point where they produced something like a prelude to the later European power-system. One may go further and conclude that there must have been an underlying general affinity between the texture of political life in Renaissance Italy and the structure of the modern state. To refer to one example of recent date, when Professor Heckscher, in his broad study of modern Mercantilism, confronted the medieval and modern economic pattern by pointing out the interrelationship between industrial "Protectionism" and the modern state, he found the first appearance of the protectionist policy of the modern type in the Italian city-states and even more in the urbanized regional states which formed the power-system of fifteenth-century Italy.[13] From my own knowledge I should say that it is possible to round out such analogies for the whole orbit of political life. For instance, not only was the mechanism of modern power-diplomacy anticipated in the

[11] I refer particularly to Ptolemy of Lucca, to whose pivotal place in the history of republicanism and the ideas of active citizenship Professor McIlwain has been the first to draw full attention. See *The Growth, etc.*, 336–338.

[12] For a more detailed discussion of the survival of civic liberty in the Quattrocento and the effects on political and historical thought, see the writer's papers on "The Historical Background of the Florentine Renaissance," *History*, N.S. XXII (1938), 315–327; "A Sociological Interpretation of the Early Renaissance in Florence," *The South Atlantic Quarterly*, 38 (1939), 427 ff., espec. 438–448; and several of his earlier studies listed in the latter place.

[13] Eli F. Heckscher, *Mercantilism* (Engl. transl. 1935), II, 139 ff., and *passim*.

time of Lorenzo de' Medici (as Dr. Nelson emphasized in his paper), but the idea of a "balance" between equal members of a state-system then, as later in the modern West, issued from a cycle of events that had started with the threat by one power to transform the whole system into a single universal state—a threat followed by wars of independence, from which the individual states emerged conscious of their identity, strengthened in national feeling, with the will to assert themselves in a balance of power.[14] In short, it is not alone in diplomatic technique (the feature which immediately spread from Italy throughout Europe), but in the inherent dynamics of international relations that Renaissance Italy foreshadowed the character of the family of modern western nations.

Bearing these facts in mind, we shall find it hard to subscribe to any judgment to the effect that, from the viewpoint of political ideas and conditions, the twelfth century was more significant than the fifteenth century. At the present stage of our knowledge, the only fair judgment seems to be one not couched in the terms of an alternative. As far as the political pattern of modern life is characterized by the existence of nation-states, spanning a large geographical area by virtue of representative government, the foundation laid in the Middle Ages looms larger indeed than any possible contribution by the Italian Renaissance. Still, when we ask what after all distinguishes modern political life from the feudal epoch, it is of equal significance that the *state of aggregation* of the modern world, as it were, was first foreshadowed in the Italian Renaissance, with a political system of smaller compass and simpler sociological conditions—albeit the nation-state and the representative system had not yet entered into the historical compound.

II

These observations in the field of political history will help to unravel the apparent contradictions confronting us in the history of Quattrocento science. Virtually all the recent re-interpretations of phases of intellectual life in the fourteenth, fifteenth, and sixteenth centuries, to which Professor Durand refers in his memoir, have used one standard of evaluation—the question how much the authors and schools of thought studied contributed to the rise of

[14] See the writer's outline in *The South Atlantic Quarterly*, 38 (1939), 438 ff.

modern natural science. But to the humanist Renaissance of the fourteenth and fifteenth centuries interest in natural science, however fundamental to the modern world, was as unfamiliar as the institutions of the modern nation-state. Natural science was the one great sector of intellectual activity that was almost wholly excluded from the humanistic program for almost a century and a half, in favor of the new study of man and history.[15] It is in accord with this fact that Burckhardt based his evaluation of the fifteenth century on no excessive claims for any originality in the field of science. Partly for these, partly for personal reasons, he largely omitted science from his *Civilization of the Renaissance in Italy*—as did most of the subsequent accounts of the period. Only in monographic contributions to the history of the sciences has an attempt been made to establish "primacies" for the fifteenth century in positive science also—primacies outside the humanistic movement, notably of Toscanelli in Florence and of the Averroism of Padua. These studies in fifteenth-century science, long impaired by chauvinistic prejudices, as Dr. Durand has pointed out, have recently received an objective critical revision, largely through the efforts of American scholars. Closer investigation—particularly such as made by Professors Thorndike and Randall[16]—has shown that in fact no startling innovations were made before the end of the fifteenth century, although the ban on science by humanists did not prevent studies of the medieval type from being continued throughout the Quattrocento. But when these statements are made, what does this mean for the validity of Burckhardt's picture? Apparently no errors of perspective have been detected in his analysis, but a much broader basis has been made available for re-examining the meaning of the humanist disregard of science and of the cursory treatment of this sector of intellectual life in many modern portraits of the Renaissance.

The best way to explain how temporary aloofness from science could foster the growth of humanistic thought and, indirectly, even

[15] A point which has been agreed upon and discussed in its implications by students of early humanism. See the clear analysis of "Salutati's transfer of interest from the external universe to man" in Florence about 1400, in the paper on "Plato and Salutati" by Revilo P. Oliver, in the *Transactions of the Amer. Philological Association*, 71 (1940), 324 ff.

[16] The latter in his paper on "The Development of Scientific Method in the School of Padua," this *Journal*, I (1940), 177–206.

that of later science, is to refer to the rôle played by early humanists in the overthrow of astrological superstition. It is well known that Petrarch's fight against the Averroists of Padua sprang to a large extent from his resistance to astrology, which permeated science in the Averroist atmosphere. So closely knit were astrological notions with the fabric of all science in the late Middle Ages that Petrarch, clinging to Cicero's scorn of superstition of every type, was almost unique in rejecting astrology as a whole. Against this fourteenth-century background one must note the following facts from the Quattrocento. When in its second half leading humanists—as well as philosophers influenced by the humanist movement—began to remove the ban on science, the result was a widespread return to astrology, a century and a half after Petrarch. Giovanni Pontano at Naples then worked out what may be called a system of astrological psychology, while Marsilio Ficino in Florence contributed a type of astrological medicine[17]—innovations in the field of science that were by no means dead-born, but ushered in a new era of astrological ascendancy which, in many respects, was to last until the middle of the seventeenth century. Now it is true that the same terminal decades of the Quattrocento saw the first systematic and conclusive attack upon astrology—the famous books of *Disputationum in Astrologiam* by Giovanni Pico della Mirandola. But this criticism did not come from the most advanced scientist, but was ventured by the very Italian thinker who kept aloof from renewed contacts with science more completely than did any of his important contemporaries. What, then, was the source of inspiration for this epoch-making exploit? Professor Cassirer, in his presentation of the philosophy of the Renaissance, offers the following account: "The belief in the creative power and autonomy of man, this genuinely humanistic belief, was the factor to triumph over astrology with Pico," not empirical-scientific motives, not "the new methods of observation and mathematical computation." "The first decisive blow was struck before these methods reached perfection. The real motive for the liberation from astrology was not the new concept of nature, but the new concept of the intrinsic dignity of man."[18] More recently Cassirer

[17] B. Soldati, *La poesia astrologica nel quattrocento* (Firenze, 1906), 229 ff., for Pontano; E. Panofsky and F. Saxl, *Dürers Melencolia I* (Leipzig, 1923), 32 ff., for Ficino.

[18] Ernst Cassirer, *Individuum und Kosmos in der Philosophie der Renaissance* (Leipzig, 1927), 125 f.

has added this perspective: "It is curious to consider how much harder it was for Kepler, a veritable scientific genius, to escape the bonds of the astrological way of thinking. . . . Kepler himself could probably not have taken the final step, had not Pico, upon whom he expressly relies, preceded him . . . : there was needed a new attitude and a new sense of the world."[19] There may still be some doubt, as Cassirer himself says, as to the extent to which lay movements outside Italy—particularly the *Devotio Moderna*—contributed their religious spiritualism to the humanistic roots of Pico's critical assault, especially through the agency of Cusanus[20]—a problem of European interchange to which we shall presently return. But the essential lesson to be learned concerning the relationship between fifteenth-century science and the cultural innovations in the Quattrocento scene is clear: the humanists were not entirely wrong in their belief that natural science in its fourteenth- and fifteenth-century phase had little to contribute to the new ideas championed by humanism.

But with this eclipse of natural science, however logical under fifteenth-century conditions, how could humanistic culture have been close in spirit to modern thought? To ask this question is, in Dr. Durand's eyes, to reveal its absurdity. Yet it is a precise parallel to the questions that we have tried to answer in the field of political history. There, in fact, we observed a structure of Quattrocento life that did in many respects foreshadow the modern pattern, despite the circumstance that certain fundamentals of the modern state (nation-wide unity and representative government) were lacking in the Italian Renaissance. These facts should warn us to withhold judgment with regard to "tradition" and "innovation" in intellectual life, until both possible perspectives—that of similarities in "structure" as well as that of "continuity"—have been discerned.

A milestone in our knowledge of the rise of science, no doubt, is the discovery that positive scientific work, gradually expanding

[19] In this *Journal*, III (1942), 343 f.

[20] Regarding this aspect of Pico's indifference toward astrology, see this writer's study of "Willensfreiheit und Astrologie bei Marsilio Ficino und Pico della Mirandola" (in *Kultur- und Universalgeschichte, Festschrift für Walter Goetz* [Leipzig, 1927], 145–170), where a more substantiated confrontation of Pontano's and Ficino's "scientific astrology" with Pico's lack of dependence upon scientific argument has been attempted.

beyond the ancient legacy, was started in the late medieval schools; that in this way a tradition was built up which was still an essential element in Galileo's day; and that fifteenth-century Italy contributed but little to this coherent growth. Yet with our knowledge of the effects of humanistic thought on astrology, we must conclude that this discovery does not settle the problem in all its aspects. It certainly does not exclude the possibility that, outside the continuity of academic science, the Quattrocento may have produced such philosophic views and intellectual habits as on the one hand could foreshadow characteristics of the later "scientific mind" and on the other in due time react on science itself. This means that the question still remains, to what extent did the general transformation of the cultural atmosphere in the Quattrocento either anticipate or even *indirectly* influence the change from "medieval" to "modern" science in the sixteenth century?

Couched in these general terms, the problem seems to threaten to lead us into that blind alley of search for an "intangible spirit," against which Dr. Durand warns us in his paper. But the vagueness disappears as soon as the inquiry is reduced to the concrete questions, how far the scientific revolution of the sixteenth century was a consequence solely of the intrinsic growth of thought, a product of the cooperative efforts of schools and academic associations; and how far, in the critical stage, even science was dependent on contemporary changes in moral values, religious and philosophical convictions, and on the relations of thought and practical experience in the life of those engaged in scientific pursuits. This problem, already attacked by recent students, is open to proof or disproof by historical evidence. Should we find essential contributions made by factors reacting on science from outside, then fifteenth-century Italy, despite its barrenness in science in the proper sense, may still appear as instrumental in producing the indispensable frame for the sixteenth-century revolution of science.[21]

[21] In substance this problem was posed by Dr. Randall in this *Journal* two years ago, in the introductory paragraphs of his paper on "The Development of Scientific Method in the School of Padua," Vol. I (1940), 177–184. But Randall concentrated his investigation on "the organized scientific traditions of the later Middle Ages" as one of the trends leading up to modern science, while here an attempt is made to weigh what may have gone into Galileo's work from humanist and other Quattrocento sources. I cannot agree with Randall's evaluation of the humanist component when he says that "in contrast with the cumulative and organized elaboration of the theory

III

The first example to be examined in this light concerns the possible rôle of the "Quattrocento spirit" only in part, since the developments of lay society and thought outside Italy had a large share in its intellectual formation. But as the case of Cusanus, which I have in mind, contains the most challenging implications for every approach to fifteenth-century science, it has become a focal point for Renaissance debate and has been used as such by Dr. Durand. However, as the intellectual forces by which Cusanus' mind was moulded were largely of non-Italian origin—an earlier counterpart to the mixture of northern and Italian elements in Pico della Mirandola—it should be emphasized that our characterization of the Renaissance as a "prototype" of the modern world is not meant to imply that every aspect of modern thought must first have appeared in fifteenth-century Italy. Many well-known phases of Quattrocento life undoubtedly had parallels in the contemporary culture of other European countries, and not a few characteristics of the modern mind—particularly all those connected with the rise of a new lay piety—found even more favorable conditions outside of Italy. Quattrocento culture gives the well-known illusion of a "radical break with the Middle Ages,"[22] because the peculiar structure of Italian society and its kinship with ancient Roman civilization intensified cultural change and caused so rapid a pace of evolution that fifteenth-century Italy experienced many social and intellectual developments which did not appear in the rest of Europe until centuries later. Yet, even so, the Italian Renaissance was merely part of a greater phenomenon, which, in different ways, and with varying speed, was appearing all over Europe. There was constant interrelation between the "Italian Renaissance" and the Renaissance as a movement continental in scope. The first great personality in whom all the elements of Renaissance "innovation," both inside and outside Italy, combined was Nicholas of Cusa.

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and method of science" in the late medieval universities "the many humanist seekers, revolting from . . . scholasticism . . . , seem to have displayed all the customary ignorance and futility of intellectual revolutionaries, and to have proposed new methods distinguished chiefly by the novelty of their ignorance." I do believe that a mediate but essential contribution by humanist and other Quattrocento trends to the growth of science can be proved and that Randall's fresh treatment of the Paduan School and the following exposition may supplement each other in vital points.

[22] Durand, *supra*, p. 1.

Cusanus' rôle in the overthrow of medieval cosmology—before cosmology had become a part of Renaissance interests in Italy—has given rise to the most conflicting interpretations. Professor Durand has recalled the fact that certain German scholars made the mistake of reading "anticipations of Copernicus into the mystico-scientific speculations of Nicholas of Cusa," while they attributed heliocentric ideas to this mystic of the fifteenth century—an error that has been bitterly assailed by Thorndike.[23] One must insist, however, that these corrections have settled the matter only so far as the time and circumstances of the emergence of modern astronomical concepts are concerned. The general historical problem in the background, the real cause of those misinterpretations, is left unsolved. The intricacy of this problem is revealed by the fact that, although Cusanus did not have at his disposal, nor did he anticipate, the relevant astronomical data, he did develop the notion that the earth was not low and vile, far below the divine heavens of the stars, but was itself a "noble star," along with the others. He rejoiced over this vindication of the earth in words that were well known to and almost literally repeated by the founders of the heliocentric theory in the sixteenth century—while even in the seventeenth century acceptance of the Copernican system was still obstructed by the argument that the earth, in consequence of her "vileness," must be in the center of the universe, this being the worst possible place and farthest removed from the incorruptible bodies of the stars. All these facts and similar aspects of the Cusanus case have been emphatically pointed out by two philosophers who can hardly be suspected of having any chauvinistic axes to grind—Professor Cassirer (in the introductory chapter of his *Individuum und Kosmos in der Renaissance*) and Professor Lovejoy (in the chapter "The Principle of Plenitude and the New Cosmology," in his *Great Chain of Being*).

From this the only plausible conclusion seems to be that in the case of cosmology the isolated study of the history of science leads one astray; that the perspective that emerged from mysticism—or, better, from a combination of mysticism, Platonism, and stimuli from the Italian Renaissance—for the evaluation of life and a metaphysical interpretation of the world, anticipated observations in astronomical science leading to similar conceptions of the universe.

[23] Durand, *supra*, p. 8.

But if in this case the growth of science was closely intertwined with strands of thought which had their origin outside the scientific sphere, can we believe that a profound mutation of culture and society, such as that which took place in Italy, would not have finally reacted on science in a similar way, on an even grander scale, and with more conclusive results? It is, of course, impossible to attempt any exhaustive inquiry into this problem within the compass of this critique. Moreover, the selection of evidence depends largely upon the notions of "science" that are taken as a standard —notions that are disputed and must be adapted to the changing needs of Renaissance research by experts in the history of science. Still, certain general conclusions suggest themselves immediately when for the Quattrocento such problems are raised as have been recently discussed by students of the period of Galileo.

There is no better subject to begin with than cosmology, as the discussion of Cusanus has revealed. It is not necessary to emphasize the bonds of kinship which had existed between the *Weltanschauung* of the Middle Ages and a type of cosmology which held that the heaven of the stars was composed of ether, an element purer than anything on this sinful earth; where man lifted up his eyes to the changeless movements of the stars—signs of divine perfection and eternal laws, for which he knew no parallel on earth. Not for scientific reasons alone, therefore, did the idea of the universe as a hierarchy composed of pure and less pure spheres hold the allegiance of medieval man. This cosmic system was consistent with his habit of thinking in terms of a gradational hierarchy and a static divine order in all spheres of life. When Galileo struck the final blow against this old cosmology, proving that the stars are made of stuff no different from earthly things, and that they follow the same natural laws that rule the human sphere, he rebelled against the medieval past not only as a scientist, but also as a son of an epoch in which man rejoiced in the idea that earth and stars and every particle of the universe are equal in perfection, none degraded for eternity. To regard this new frame of mind as sufficient cause for Galileo's attempt to prove the operation of the same laws in the stellar sphere and on earth, would be to overstress a single factor. But the distortion is equal when the profound change in the human evaluation of life, which was a necessary con-

comitant of the transition from a gradational and static to a decentralized and dynamic universe, is regarded as negligible. When Galileo jubilantly noted the definite proof that this our earth is physically one with moon and stars, *non autem sordium mundanarumque fecum sentinam esse,*[24] he knew that he was repeating the triumphant words of Cusanus, uttered long before the claim was supported by scientific discoveries. He also knew that he was transforming and expressing in exact mathematical language the lofty idea of a decentralized, infinite Nature, evolved from philosophical speculation—first through the vitalism and panpsychism dominating biology, medicine, and chemistry early in the sixteenth century, and finally by Giordano Bruno's pantheistic conviction that one and the same divine power unfolds itself restlessly in every particle of the world.

Today, because of the prevailing tendency to accept the coming of the mathematical method as the decisive factor distinguishing "new" from "old," Giordano Bruno, who once seemed to represent the climax of Renaissance philosophy, has receded into the background. Yet Bruno, standing at the cross-roads, provides the best evidence that genuine elements of the Renaissance went into the crucible of modern scientific thought. Although he failed to perceive the full meaning of the mathematical method and the mathematical concept of the infinite, he had a firm grip on the cosmological idea of the infinity of the universe, and in it found a sufficient basis for revolt against the Aristotelian-scholastic concepts of finite space and a finite world. From Bruno's work one can perceive the almost logical train of the phases of Renaissance thought: experience of the boundlessness of human passion and of the search for knowledge—the basis common to Renaissance ethics and psychology since Petrarch—found a corollary in the idea of the infinitude of the physical universe; while the infinitude of physical energies in turn needed as its vehicle, as it were, the infinitude of space—the idea that was to burst asunder the concept of a static finite world. "Here too"—quoting from Cassirer's description of this fundamental concatenation of Renaissance thought—"it is a dynamic motive which overcomes the static structure of Aristotelian-scholastic cosmology, . . . not (yet) as a new

[24] In his *Nuncius Sidereus* of 1610; discussed by L. Olschki, *Galilei und seine Zeit* (1927), 218.

science of dynamics, but as a new dynamic feeling underlying the cosmological outlook.''[25]

In other words, the story of the birth of modern science cannot be fully told before inquiry is made into the causes of the rising tendency to see life in a ''dynamic'' vision; before it is explained how the belief in the universe as an immovable, God-given order was overcome by the idea of a decentralized, infinite universe, a world in evolution, and so paved the way for the later readiness to reduce all physical phenomena to a successive flux, and for the evolutionary views characteristic of modern thought.

To reconstruct this story means to find a place for the fifteenth-century Renaissance in the rise of science. The static world of medieval man had inspired conviction as long as the idea of hierarchic order had reigned supreme in every field, in human history as well as nature. The famous doctrine of four universal empires succeeding one another as a divinely created frame of history, with the Roman empire as the last, placed above historical flux and destined to endure to the end of history, was the exact equivalent in historical outlook of the gradation of the crystal spheres in the Ptolemaic system. Again, when the idea of a *Sacrum Imperium,* more ''perfect'' than the other states, was destroyed by the notion of a decentralized history with empires and smaller states all on one level of natural growth and decay, the revolution in historical outlook thus revealed was a precise counterpart to the emergence of a dynamic, decentralized view of nature. The intellectual and psychological effects of rebellion in either sphere were bound to be akin and to react on one another.

[25] *Individuum und Kosmos,* 197 ff. The roots of this vista can be traced to W. Dilthey's epoch-making works on the intellectual history of the Renaissance, collected in his volume *Weltanschauung und Analyse des Menschen seit Renaissance und Reformation* (first edition 1913). The rôle of the new psychology is discussed in the treatise "Die Funktion der Anthropologie in der Kultur des 16. und 17. Jahrhunderts" (*ibidem,* 416 ff.), the effect of evolutionary pantheism and vitalism on cosmology and the rise of a dynamic view of nature in the paper entitled "Der Entwicklungsgeschichtliche Pantheismus" (*ibidem,* 312 ff.). In the latter study (particularly 346 f.) Dilthey gives his considered opinion on the fruitfulness and the necessity of the historical union of the "new scientific imagination," already apparent in Bruno, with the new quantitative-mathematical method, which for the first time in history made possible "concerted collaboration of scientists" and a "steady progress of scientific thought."

But the two processes, although related in their meaning for intellectual life, did not occur at the same time. At the end of the Middle Ages, as in all other periods of history, intellectual energy was first concentrated on certain sectors of life until, with revolutionary results achieved, interest shifted to other fields. By the end of the humanistic Renaissance of the Quattrocento, a dynamic, decentralized view had emerged in history and political science, with its first great expression in the works of Machiavelli and Guicciardini. In the sixteenth century the same vision began to transform cosmology and, indeed, all notions of nature. Machiavelli's *Discorsi sopra la prima deca di Tito Livio* (finished, in substance, in 1513) and Galileo's *Dialogo sopra i due massimi sistemi del mondo* (finished in 1632) were complementary phases of one historical process. Both deal with the same problem of the dynamic vision of a decentralized reality; both represent the triumph of the vernacular, and thus of closer contacts with the lay world, in their respective fields. Finally, to the question why the "discovery of man and history" should have occurred first in the Renaissance, while the "discovery of nature" followed, the answer seems to be that the experience and sentiments of the citizen of the Italian Commune first produced new conceptions of culture, politics, and history. When the historical outlook and the ideas of human nature had been remade, the change in perspective, in a second phase, would react on natural science.

If these considerations are sound, fifteenth-century Italy contributed one of the most decisive "innovations" to the development of modern science. This contribution, it is true, had little immediate effect on science, but in the broader intellectual life it caused the rise of those very problems and attitudes of mind that were to provide the indispensable frame of thought for the transition from "medieval" to "modern" science, a hundred years later. Now one may wonder whether inquiry into the nature of such general cultural relations must be included in the discussion of the evolution of natural science and should not be left rather to the care of students in other fields, particularly in the history of philosophy. However, the need for specialization in practical research is one thing, while the need to give to individual results their proper place in a synoptic vision of all the vital forces of a period is another. If it is true that mental attitudes and problems

are apt to spread across the separate departments of culture, and that this dissemination of new concepts often requires the span of generations, two inferences seem inevitable: first, that no estimate of the forces of "tradition" and "innovation" in any period is reliable if based on research in a single field; and second, that neither science, nor political thought, nor any single cultural activity can be understood in its specific evolution, unless allowance is made for cases in which essentials of progressive growth—for instance, the awareness of natural laws, or the power to make causal observation and research—are born and first elaborated in sectors of intellectual life remote from the particular field of our learned specialization.[26]

In historical sciences older and riper than the comparatively recent Renaissance scholarship, integration of the results of study in neighboring fields has undoubtedly progressed much farther than in present Renaissance research. A familiar example is, in the history of early Greece, the unravelling of the subtle threads connecting Ionic nature philosophy and the political thought of the Sophists. It may be useful to bring home the point by quoting the following account from Professor Sabine's recent *History of Political Theory:*

> At the start the fundamental [Greek] idea of harmony or proportionality was applied indifferently as a physical and as an ethical principle and was conceived indifferently as a property of nature or as a reasonable property of human nature. The first development of the principle, however, took place in natural philosophy, and this development reacted in turn upon its later use in ethical and political thought. . . . The objects that made up the physical world were to be explained on the hypothesis that they were varia-

[26] I may here quote a few sentences from the article with which Professor Lovejoy prefaced the first volume of this *Journal*. "A preconception," he pointed out, "category, postulate, dialectical motive, pregnant metaphor or analogy, 'sacred word,' mood of thought, or explicit doctrine, which makes its first appearance upon the scene in one of the conventionally distinguished provinces of history (most often, perhaps, in philosophy) may, and frequently does, cross over into a dozen others. To be acquainted only with its manifestation in one of these is in many cases to understand its nature and affinities, its inner logic and psychological operation, so inadequately that even *that* manifestation remains opaque and unintelligible. . . . There is, unhappily, no law of nature which specifies that all, or even the most important, antecedents of a given historic effect, or all or the most important consequents of a given cause, will lie within any one of the accepted subdivisions of history" (Vol. I [1940], 4). These methodological reflections and the above analysis of Renaissance conditions will, it is hoped, illuminate each other.

tions or modifications of an underlying substance which in essence remained the same. The contrast here is between fleeting and ever-changing particulars and an unchangeable "nature" whose properties and laws are eternal. . . . But at about the middle of the fifth century . . . [there was] a swing in the direction of humanistic studies, such as grammar, music, the arts of speech and writing, and ultimately psychology, ethics, and politics. . . . The Greeks had [now] become familiar . . . with the variety and the flux of human custom. What more natural, then, than that they should find in custom and convention the analogue of fleeting appearances and should seek again for a "nature" or a permanent principle by which the appearances could be reduced to regularity? The "substance" of the physical philosophers consequently reappeared as a "law of nature," eternal amid the endless qualifications and modifications of human circumstance.[27]

There is no reason why, in the fifteenth and sixteenth centuries of our era, the inverse sequence of, first, humanism and politico-historical science and, secondly, natural science should not be interpreted in similar terms. When viewed in this light, the balance between "promise" and "prejudice" in the Quattrocento will take on a different aspect.[28]

IV

So far we have attempted to show that a change in the structure of intellectual life did have a part in the growth of positive science in the sixteenth century, and that there had been precedents in fifteenth-century Italy for the new frame of mind essential in Galileo's period. With these facts as a background, there is more

[27] George H. Sabine, *A History of Political Theory* (1937), 26–28.

[28] In its essentials the perspective outlined was familiar to G. Gentile and other Italian students of the philosophy of the Renaissance, when they held that there was an evolution from the "humanistic" thought of the fifteenth century to the mind of the "Renaissance" in the sixteenth, when interest in nature was incorporated in the humanistic trend of thought. However, this perspective remained restricted to the field of philosophy and was delineated in so abstract a way that it never greatly influenced historians of science. See the following passages from Gentile's essay "Il carattere del Rinascimento" (in his *Giordano Bruno e il Pensiero del Rinascimento* [2nd ed., 1925], 3 f.): From the fifteenth century to the sixteenth "there was a spiritual mutation, manifest in the extension of the sphere of interest," which for the fifteenth-century humanist meant merely the study of things human, including the historical tradition; "while the man of the Renaissance looked beyond himself, comprehending in his mind the totality of the world, of which man is a part and in which he must live. *Il punto di vista umano diventa punto di vista naturale:* which is still the same viewpoint as before, but broadened in such a way as to re-include nature in the range of vision."

concrete meaning in the claim that the importance of the Quattrocento lay in a new type of thinking, in a fresh approach to intellectual problems, and not in the extent of the innovations that were immediately effected in the specific sciences and arts.

We may now add a second illustration—one hardly less decisive, taken from the *sociological* aspects of modern science. This factor Dr. Durand touches upon when he mentions "the happy union of the hand, the eye, and the mind, which reached its perfection in Leonardo da Vinci," i.e., the observational and experimental work of Quattrocento artists and engineers outside of humanism and academic science—a trend unfortunately excluded from Dr. Durand's picture because (in his own words) the assessment of its "theoretical contributions to the whole of Quattrocento science must wait for further monographic research."[29] But are we really justified, on this ground, in omitting an appraisal of these artist groups from an attempted "balance sheet" of the fifteenth-century Renaissance? If their "fruitful work," as Dr. Durand says, was "undeniably a chief glory of Quattrocento Italy," it is difficult to see how one could reach any fair balance between its elements of tradition and innovation, while eliminating one of the most interesting potential factors of "innovation." Fortunately for our purposes, the point about these groups most strongly emphasized by recent students is not so much their possible contribution of clearly defined theories, as the psychological and intellectual consequences of the appearance of foci of practical, unacademic investigation in the field of science. But before applying the sociological perspective to the fifteenth-century set-up, we must provide a framework by summarizing the results already gained with this approach for the history of science in the period of Galileo.

The import of Galileo's scientific work springs, roughly speaking, from two major achievements: his bringing to a triumphant conclusion the cosmological revolution that had been growing throughout the Renaissance; and his reduction, final and irrevocable, of science to measurement, quantity, and motion—to mathematics working on data supplied by observation, checked by experiment. To the problem of the origin of this mathematical method much study has been given in recent years. To a degree,

[29] Durand, *supra*, p. 1.

stress on mathematics as the core of true knowledge had long been an element of Platonist epistemology and metaphysics. In the wake of Platonism, it had come to the fore with Cusanus, and again with Kepler, a fact highly emphasized by Cassirer in his various works.[30] Yet, though positive science—in its Averroist and its Ockhamite branches—developed at the late medieval universities, and induction, observation, and even the precedents of Galileo's combination of analytic-resolutive and constructive-compositive methods gradually appeared,[31] mathematics did not, until the middle of the sixteenth century, obtain its modern place in scientific research. In the School of Padua—as shown by Professor Randall and re-emphasized by Professor Durand[32]—it was largely from the Latin revisions of Archimedes by Tartaglia in 1543 and by Commandino in 1558, that mathematical interests and methods slowly began to penetrate physical science.

These conclusions, important and definite though they are, seem to require some comment. The appearance of a convenient revised edition of the familiar work of an ancient mathematician, however eagerly welcomed and utilized by leading Paduan scholars, would not in itself explain the triumph of the mathematical method. The publication and its effects are remarkable rather as a straw in the wind, because they signalize a trend of interest which was developing in the second half of the sixteenth century. The origin of Tartaglia's interest in mathematics had little to do with the science of Padua or with any of the older schools. Tartaglia was a self-taught man, who had made all his discoveries in mathematics and mechanics in intercourse with practical engineers, gunners, merchants, and architects in northern Italy. A few decades later there were similar conditions affecting the development of Galileo. In his youth, unable to find an opportunity for mathematical training in the University of Pisa, Galileo acquired the mathematical interest characteristic of his later work by making contacts with the same type of practical mathematics. His studies were pursued under a teacher who belonged to the *Accademia del Disegno* in

[30] Ernst Cassirer, *Das Erkenntnisproblem in der Philosophie und Wissenschaft der neueren Zeit*, I (3rd ed., 1922), 32 ff.; *Individuum und Kosmos*, 15 ff., 174 ff.

[31] The latter in Averroist Padua, according to the evidence given by Professor Cassirer (in his *Erkenntnisproblem*, 1 [3rd ed., 1922], 136 ff.) and Professor Randall (in his "Scientific Method in Padua," this *Journal*, I [1940], 197 f.).

[32] Randall, *ibid.*, 205; Durand, *supra*, p. 19.

Florence, a kind of technical institute for the preparation of artists, architects, and engineers.

Thus the conclusion is suggested that it was contact with experimenting, practically-minded technicians and masters outside the schools that infused the decisive element, a fresh compound of experiment and mathematics, into late medieval science. It is this point that serves as a *leit-motiv* in the monograph on *Galilei und seine Zeit* published by Professor Olschki in 1927—a work which first called full attention to the connection of Tartaglia and Galileo with the mathematical pursuits of artists, architects, and engineers outside the academic circles. More recently, studies by Dr. Edgar Zilsel, still in progress, have traced the early contacts of the academic world with the new class of workshop engineers and foremen in the countries outside Italy—particularly from the middle of the sixteenth century onward, when scholars first undertook observational studies in the mines and foundries of the new capitalistic industries. There may be some danger of exaggeration in Zilsel's claim that the "decisive event in the genesis of science" about 1600 lay in the uniting of the two previously separated groups—the educated, theoretically-minded "upper stratum," and the practical workmen in the shops and mines, the "lower stratum," which "added causal spirit, experimentation, measurement, quantitative rules of operation, disregard of school authority, and objective co-operation."[33] Yet there is one outstanding fact which may be definitively inferred from Olschki's and Zilsel's findings: it is now better understood why natural science in the modern sense depended on the rise of a new society, no less than did humanistic education and the new political and historical sciences. The point in common is that the emergence of a new phase was everywhere bound up with the appearance of lay circles living a life of work and action from which evolved new practical skills and subsequently new theories, ideas, and evaluations of life. What the rise of an urban society, composed of practical men participating as readers and writers in a type of literature no longer produced for one rank only, meant for humanist education; what the reappearance of active political citizenship in the Italian city-states meant for political studies: this the emergence of groups educated and engaged in technological pursuits meant for the beginnings of the new natural science.

[33] E. Zilsel, "The Sociological Roots of Science," *The Amer. Journal of Sociology*, 47 (1942), 544–560, espec. 558.

Viewed in this light the Quattrocento reveals itself once more as a prototype of the modern pattern—as a precursor, even if on a somewhat variant basis. It is true that the high tide for the new technical classes, as Zilsel emphasizes, did not come until the full rise of capitalism in the mining, metal and related industries in the sixteenth century, while fifteenth-century Italy clung to the "ancient distinction between liberal and mechanical arts," with the one exception of painters and sculptors, who were "gradually detached from handicraft and slowly rose to social esteem."[34] But it was in fact this exception which in the Quattrocento brought about the first contacts of any practical profession with scientific theory, awakening scientific interest in a general cultured public outside humanism and the academic schools. In the conditions of Renaissance Italy the workshop of the artist, in fostering experimental work and stimulating observation and causal thinking, performed precisely the intellectual function that was in later centuries discharged by the industrial workshop and the scientific laboratory.

There were in the art of the Renaissance several elements capable of promoting this effect. To begin with, a type of art that placed proportion first, made truth to nature an indispensable standard, and included in the work of the artist-architect town-planning and the technique of fortifications, was bound to promote mathematical and experimental methods far beyond the reach of the medieval Schoolmen. Moreover, it was in the heart of the new urban society that the new technical skills were practiced. While passing from the detached, collectivist orbit of the masons' gild engaged in the construction and adornment of a medieval church, to the workshop of the "artist-engineer" in a busy Florentine street, art had in fact travelled a distance equivalent to that covered in the intellectual transition from the clerical atmosphere of medieval monasteries and universities to the symbiosis of thought and action in the society of the Renaissance. Thanks to the pioneering work of Professors Olschki and Julius von Schlosser we are able to form a very clear idea of those early counting, measuring, experimenting masters, accustomed to pursue self-taught studies in optics, perspective, anatomy, and the engineering work connected with the great architectural projects of the Renaissance. From Florentine groups which included Ghiberti, Brunelleschi, L. B. Alberti, and Filarete, there extended a coherent tradition of

[34] *Ibidem*, 550, 558 f.

skills and interests down to circles subsequently formed at the courts of Urbino and Milan, with the climax in the great figure of Leonardo. Continued throughout the sixteenth century, this trend became an essential influence (as was said above) on Galileo in his youth.[35]

For Florence our documents permit us to observe the existence of constant and intimate contacts between the most diversified groups of citizens, including the humanist literati, and masters of this type working on technical as well as artistic projects. The universal curiosity aroused by the public competition of Florentine artists for the adornment of the doors of the Baptistry in 1401 is mentioned in every history of the Renaissance, and the emotional appeal to the Florentine public of the pioneering problems involved in the construction of the cathedral dome strikingly foreshadowed the general interest in great technical feats in later centuries. Professor Krey, in a recent pamphlet, has given a convincing account of the importance and intensity of this exchange between the craftsman and the cultured citizen, the artist and the humanist.[36] That early humanists did not include scientific studies in

[35] Leonardo Olschki, *Die Literatur der Technik und der angewandten Wissenschaften vom Mittelalter bis zur Renaissance* (1919); *Bildung und Wissenschaft im Zeitalter der Renaissance in Italien* (1922); Julius von Schlosser, *Die Kunstliteratur, Ein Handbuch zur Quellenkunde der neueren Kunstgeschichte* (1924). The transformation of the concept of "space" derived from the practical studies of perspective and artistic proportion has been described by Professor Panofsky, in his article "Die Perspektive als symbolische Form," *Vorträge der Bibliothek Warburg*, IV (1924/25). As to the bearing upon the rise of the mathematical method and on philosophy in general, one finds in Cassirer's *Individuum und Kosmos* the first comprehensive attempt to interpret the philosophy of the Renaissance as a compound of virtually three basic trends: humanism, scholasticism, and the school of thought leading up to Leonardo—"that group which in fifteenth-century Italy, side by side with declining scholasticism and the rising humanistic culture, represents a third, specifically modern type of knowledge and bent of inquiry (*eine dritte spezifisch-moderne Form des Wissens und des Erkenntniswillens*)." (53 f.)

[36] August C. Krey, *A City That Art Built* (Minneapolis, Minn., 1936), espec. 27–47. As to the continuance of the symbiosis between workshop practice and higher culture throughout the Quattrocento see the following remark by Julius von Schlosser. During the fifteenth century, he says in his *Kunstliteratur* (83), "and even later, craft and art, *ars mechanica* and *ars liberalis*, remained together harmoniously. The divorce of the noble 'fine arts' from the 'industrial arts' (looked down upon socially), of the 'painter-artist' from the craftsman restricted to 'flat painting,' did not take place until the time of the virtuosi of the late Renaissance, and only the most recent developments have undone this separation, in theory as well as in practice."

their program should therefore not cause us to forget this subtle education of Renaissance society in scientific interests and ways of thought. There was a growing effect on intellectual life and even on humanism in the second half of the Quattrocento. If it did not produce originality in the field of natural science, it still reacted on the literary production of the mature Renaissance, providing writers with a scientific background which aided them in finding realistic ways of thought in many fields of literature and learning. In the Florence of Lorenzo de' Medici the Neo-Platonists as well as humanists of the type of Poliziano were all in intercourse with Toscanelli's circle, and the effects are palpable in their work. As to Machiavelli, his dependence on medical and biological ideas was demonstrated by O. Tommasini in his huge monograph thirty years ago.[37] Had scientific pursuits as yet not played a part, side by side with classical and political interests, in the Florentine groups which influenced the growth of Machiavelli's thought, he would hardly have possessed the intellectual tools he needed for his naturalistic analysis of political disintegration and growth.

All these factors throw light upon the existence of subtle interrelations between the "realism" of the Renaissance and the subsequent rise of the scientific spirit. But it is necessary to turn to the lonely, gigantic figure of Leonardo da Vinci to realize fully the promise for the future inherent in the scientific by-ways of the Quattrocento. Whatever may be the final verdict upon the thesis offered by Duhem—i.e., that Leonardo as a scientist largely exploited the work of Scholastic predecessors—it is evident even today that by the artist of the Renaissance something substantial was added to the legacy of the Schoolmen—a new achievement springing from the milieu of the artist-engineers of the Quattrocento. This addition was not only an advance in practical experimental skills; it included the very element which was to become the mark of modern science—the ascendancy of the mathematical method. Leonardo, long before mathematics became the royal road of academic science, contended unambiguously that "no human investigation can be called true science without passing through mathematical tests." He was convinced that any step beyond this solid foundation would lead to the illusion of understanding the substance of things, a knowledge of which "the human mind is incapable."[38] And in place of the old hierarchy of sciences, with

[37] Oreste Tommasini, *La vita e gli scritti di Niccolò Machiavelli*, II (1911), 37 ff.

metaphysics and theology supreme, he first envisaged a gradation of studies in terms of the certitude they derived from the degree in which they were penetrated by mathematics.[39]

This sudden and unique anticipation of the method of modern science is, of course, more than an isolated fact. It points to a substantial affinity between Leonardo's vision of nature and the modern scientific outlook. Indeed, viewed from any angle of the great transition from a static-centralized to a dynamic-evolutionary view of life, Leonardo's ideas and discoveries herald the things to come. With him Cusanus' exultation over the earth as one with the other stars—the "glory of our universe," as Leonardo said with Cusanus[40]—led to the first dynamic interpretation, not only of the cosmos, but of nature as a whole. To Leonardo, in the geological history of the earth, the Deluge had ceased to be the all-determining event—a counterpart to the eclipse of the *Sacrum Imperium* in historical thought—giving way to a vision of incessant flux and change. For the first time the geological scene of human life appeared as the work of oceans, rivers, winds, a world in which plants, animals, and men grow in a natural way—until this planet in some distant future shall have become cold and dry, by the working of the same natural forces, in the same natural cycle of growth and decay.[41] It is the keenness of his perception of the dynamic rotation of nature from destruction to reproduction that led Leonardo to many of his startling discoveries—such as his understanding of the change of species in flora and fauna in the course of geological history, and of the incessant processes of consumption and reproduction in all living substance.[42] For an historical per-

[39] *The Literary Works of Leonardo da Vinci*, ed. J. P. Richter (2nd ed., 1939), I, 31 f.; II, no. 1210.

[39] *Ibidem*, I, 113 f.; *The Notebooks*, ed. E. MacCurdy (2nd ed., 1938), I, 107. For suggestive analyses of Leonardo's ideas regarding the necessity of mathematics for positive science—presentations of the source material which is independent of the extent of possible scholastic influences on Leonardo in other respects—see Cassirer's *Erkenntnisproblem*, I (3rd ed.), 318 ff., and his *Individuum und Kosmos*, 161 ff.

[40] *The Literary Works*, ed. Richter, II, no. 866.

[41] Cf. the chapters "Of Rivers," "On Mountains," "Geological Problems," in *The Literary Works*, ed. Richter, II, 162–176.

[42] Compare descriptions of the cycle of death and reproduction like these: "The body of anything whatever that takes nourishment constantly dies and is constantly renewed, because nourishment can only enter into places where the former nourishment has expired. . . . And if you do not supply nourishment equal to the nourish-

spective of the Renaissance the most important point is not the fact that these discoveries along with many of Leonardo's technological inventions foreshadowed some of the later attainments of science in an astounding way, but that in their entirety they revealed the same dynamic vision contemporaneously at work in the remaking of political and historical science by Machiavelli—the vision of reality that was to transmute cosmology and, subsequently, all positive sciences, from the second half of the sixteenth century onward. One may attempt to indicate Galileo's place in intellectual history with the three key-words of experimental observation, mathematical method, and the dynamic view of a decentralized nature. All these basic avenues of later science Quattrocento thought had entered a century before, and in no half-hearted fashion.

With this delineation of the historical rôle of the "artist-engineer" we are in a position to appraise, in a fresh and concrete way, the meaning of the claim that a new type of man and thought appeared with the Quattrocento. The older interpretations of the Renaissance, based on fifteenth-century humanism and the political conditions of the Quattrocento, have been repeated and confirmed in the investigation of a new sector of Quattrocento life. Wherever, we may say, creative individuals belonged to social groups which had direct contacts with the new life of work and action—whether we think of the official-secretary, or the merchant-statesman, or the artist-engineer—there the transformed relationship of life and thought rapidly gave to experience, interests, and accepted values the shape that differentiates the modern from the medieval mind.

In the perspective of present-day research, the upshot then seems to be that Burckhardt's analysis of the Renaissance as a new

ment which is gone, life will fail in vigor. . . . But if you restore as much as is destroyed day by day, then as much of the life is renewed as is consumed, just as the flame of the candle is fed by the nourishment afforded by the liquid of this candle, which flame continually with a rapid supply restores to it from below as much as is consumed in dying above . . . ; this death is continuous, as the smoke is continuous . . . " (*The Literary Works,* ed. Richter, II, no. 843). "Why did Nature not ordain that one animal should not live by the death of another? Nature being inconstant and taking pleasure in creating and making constantly new lives and forms . . . is more ready and more swift in her creating than time in his destruction. . . . This earth therefore seeks to lose its life, desiring only continual reproduction . . . ; animals are a type of the life of the world" (*Ibidem,* II, no. 1219).

phase of psychological and intellectual development still holds its own. The definition and formulation of the results attainable through his approach have been, no doubt, modified and re-modified in the course of eighty years of subsequent investigation. What in Burckhardt's day appeared as one perspective, is now refracted in divergent strains of thought. Most of the students who still follow Burckhardt as a guide feel that his dictum of "the discovery of the world and of man" in the Italian Renaissance, i.e., his characterization of the period as that of the triumph of "realism" and "individualism," is in the light of the concrete problems of present scholarship incomplete, and needs specification. One group of recent students has emphasized the place of the Renaissance in what we have described as the transition from a static-gradational and centralized idea of life and the world to a dynamic-evolutionary and decentralized concept of man, history, and nature. Others, under the impact of increasing evidence that there was much of realism in medieval thought and art, feel it imperative to redefine the "realism" of the Renaissance—a redefinition which shifts the emphasis to the fifteenth-century discovery of objective laws in nature, history, and human psychology, with the laws of mathematics in a place of special significance for the rise of science. In the last analysis these varied views are not alternative, but complementary to each other. They represent the different avenues along which recent scholarship has been developing the Burckhardtian thesis that at the basis of the fifteenth-century Renaissance there was a fundamental change in man's outlook on life and the world—the coming of the "first-born among the sons of modern Europe."[43]

[43] A somewhat broader analysis of these two chief schools of thought developed from the Burckhardtian thesis (with the inclusion of art history, which has made vital contributions to our problem in the works of Max Divořák) may be found in two earlier summaries of Renaissance research by the present writer, in the *Archiv für Kulturgeschichte*, 17 (1927), 226–256, espec. 241–243, and 21 (1931), 95–128, 215–239, 340–356, espec. 106–119. There more is said in criticism of the widespread tendency to regard the mathematical method as the one decisive criterion of the evolution of the scientific spirit, and to slight the rôle played by vitalism and pan-psychism in Renaissance philosophy and science—a tendency from which neither Olschki nor Cassirer is immune.

Since the publication of these articles the view has been growing among students in various fields that, while "realism" as such is a trait appearing and disappearing since its first manifestation in paleolithic art, and not necessarily a preparation for the "modern spirit," the peculiarity of the Renaissance lies rather in the employ-

If, on the other hand, we are today more aware than Burckhardt of the immense importance of the continuity binding the ideas and institutions of the modern world to the medieval past, this insight neither needs nor has the power to undo the lesson learned from a century of studies of the Italian Renaissance. The task before us is increasingly to integrate the two great vistas opened up by medieval and Renaissance research, neither of which gains by their mutual disparagement.

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DISCUSSION

SOME REMARKS ON THE QUESTION OF THE ORIGINALITY OF THE RENAISSANCE

By Ernst Cassirer

I am very glad to accept the kind invitation of the editors of the *Journal of the History of Ideas* to take part in the discussion of "the originality of the Renaissance." But I should prefer not to limit myself to repeating here my own views on this theme, which I have treated in several works, and to justifying them with new arguments. If the question seems to have been so little clarified as yet, and if we are still receiving diametrically opposed answers to it, the responsibility lies, in my judgment, less with any difference of opinion concerning the historical materials themselves than with a lack of clarity as to the *problem* and the *method of investigation* in the his-

ment of realism in the service of new ideas of the nature and dignity of man and as a help for the discovery of objective natural laws. It is particularly a study by J. Huizinga, "Renaissance und Realismus" (in his *Wege der Kulturgeschichte* [1930], 140–164), that has impressed students of the Renaissance with the necessity of these discriminations. (See this writer's note in the *American Histor. Review,* 46 [1941], 621 ff.). As to the element of "individualism," the discussion of this other Burckhardtian earmark of the Renaissance has passed through similar phases. When many cases of "individualism" were discovered all over the Middle Ages, and in practically every historical period, one group of scholars began to reject the idea that the Renaissance was more "individualistic" than the medieval centuries. But other students, while acknowledging that "individualism" without further specification is not a label distinguishing any one particular epoch, have been increasingly at pains to differentiate the "individualism of the Renaissance" from the individualism observed in other periods. For a study of this latter type, and also an able summary of the recent discussions of Renaissance individualism, see Norman Nelson, "Individualism as a Criterion of the Renaissance," *The Journal of English and Germanic Philology,* 32 (1933), 316–334.

tory of ideas. This point is very clearly brought out in the present papers of Durand and Baron. The following remarks are merely intended to amplify the expositions of both writers in this one particular.

Every philologist is acquainted with the phenomenon we call "semantic change." For linguistics the phenomena of phonetic change, analogic change, and semantic change constitute the only possibility of explaining the facts of language.[1] In semantic change the old forms of speech may indeed be long preserved, but their meaning shifts, and is at times even transformed into its very opposite. This holds also of "semantic change" in history. But the historical "meaning" of a given "idea" is not so easy to ascertain as the linguistic meaning of a word. It always requires a difficult and painstaking analysis. I must refuse to go into this important question here in detail; but I should like to attempt to illustrate it in a few cases which have been much discussed in the recent literature dealing with the Renaissance, and which it seems are at present in the focus of attention.

I. The antecedents of Galileo's science are now much more precisely known than they were a few decades back. When I began my studies in Galileo forty years ago, this field was largely a *terra incognita*. A turning-point here came with the investigations of Duhem.[2] It became clear that by the sixteenth century Aristotle's theory of motion no longer enjoyed the undisputed authority which had often been ascribed to it. We now know that long before Galileo there was a new theory of "impetus" which in many ways prepared the ground for Galileo's dynamics. The antecedents of Galileo's theory of method have also been thoroughly and intensively examined.[3] I clearly remember how surprised I was when in studying Zabarella's works I came upon an explicit statement of the difference between the "compositive" and the "resolutive method" which seemed to show a very marked analogy to Galileo's conception. In my examination of the problem of knowledge I laid great emphasis on this circumstance, which seemed to me very significant historically.[4] That Zabarella was here only one link in a great chain, that he was following a century-old tradition that extends through the whole history of the School of Padua, I have recently learned from Professor Randall's study.

But can all this historical evidence seriously shake our conviction of the incomparable scientific originality of Galileo? I believe that it can only serve to strengthen this conviction and to support it with new arguments. Galileo was completely right when in his *Discorsi e Demonstrazioni* he explained that he was presenting "a very new science about a very old sub-

[1] Cf. Leonard Bloomfield, *Language*, 2nd ed., chapters 20–24.

[2] Cf. *supra*, p. 6.

[3] J. H. Randall, Jr., "The Development of Scientific Method in the School of Padua," this Journal, I, 2, 177–206; Philip P. Wiener, "The Tradition behind Galileo's Methodology," *Osiris*, I (1936), 733–46.

[4] *Erkenntnisproblem*, I (2nd edition, 1911), 136 f.

ject." A work like the dynamics of Galileo could not come to birth all at once, like Athene from the head of Zeus. It needed a slow preparation, empirically as well as logically and methodologically. But to all these given elements Galileo added something completely new. No one before him had been able to make the kind of *use* of the "resolutive and compositive method" that Galileo made in his demonstration of the laws of falling bodies or in his discovery of the parabolic form of the trajectory. All this is wholly new and unique—and unique not only as a particular discovery, but as the expression of a scientific attitude and temper. For it is the significance and value attached to the mathematical method, not its mere content, that introduce a clear change over the fifteenth century.

That mathematics, to use Kant's expression, is the "pride of human reason," had never been seriously disputed since Plato's time. Augustine likewise speaks with the greatest enthusiasm of mathematics and its "eternal truths," which open to us an immediate entrance into the intelligible world. And even the idea of a mathematical science of nature by no means first originated in the fifteenth and sixteenth centuries. The necessity of a strictly mathematical treatment of optics was recognized, for instance, by Roger Bacon: "*Virtus efficientis et materiae sciri non potest sine magna mathematicæ potestate sicut nec ipsi effectus producti.*"[5] And we seem to find an anticipation of Galileo's conception of causation when William of Ockham explains that no event can be regarded as the cause of another "*nisi per experientiam possit convinci ita scilicet quod ipso posito alio destructo sequitur effectus, vel quod ipso non posito quocumque alio posito non sequitur effectus.*"[6]

But all these analogies, to which might be added many others, prove nothing. Mathematics had been an *element* in culture long before the Renaissance; but in the Renaissance, with thinkers like Leonardo or Galileo, it became a new cultural *force*. It is the intensity with which this new force fills the whole intellectual life and transforms it from within that we should regard as what is significantly new. "He who scorns the very great certainty of mathematics," says Leonardo, "is feeding his mind on confusion, and will never be able to silence the sophistical teachings that lead only to an eternal battle of words."[7] This is the conviction of Galileo also. For him mathematics is not one *field* of knowledge, but the only valid *criterion* of knowledge—the norm by which all else that is called knowledge is to be measured and before which it must pass its tests.

This new estimation of the value of mathematical physics rests on another

[5] *Opus Majus*, IV, II, i (ed. F. H. Bridges [Oxford, 1900] I, 110).

[6] Cf. Galileo's *Saggiatore, Opere* (*ed.* Alberi), IV, 216: "Quella e non altra si debbe propriamente stimar causa la qual posta segue sempre l'effetto, e rimossa si rimuove."

[7] Leonardo da Vinci, *Scritti letterari* (*ed.* J. P. Richter), No. 1157, II, 289.

underlying idea. In medieval philosophy we find a *bifurcation of knowledge*, which we meet first in Augustine and which then runs like a red thread through the entire history of scholasticism. It is the divorce between "*scientia*" and "*sapientia.*" "*Scientia*" is the knowledge of "natural" things, "*sapientia*" the knowledge of "supernatural" things. *Scientia* is concerned with the "*regnum naturae*," *sapientia* with the "*regnum gratiae.*" The unquestioned pre-eminence, the "primacy" of *sapientia* over mere *scientia*, is established for all medieval thinkers. "*Si ergo haec est sapientiae et scientiae recta distinctio,*" says Augustine, "*ut ad sapientiam pertineat aeternarum rerum cognitio intellectualis: ad scientiam vero temporalium rerum cognitio rationalis, quid cui praeponendum sive postponendum sit, non est difficile judicare.*"[8] According to this distinction any mathematical science of nature—if there is such a science—is a science of the created world; it can hence never claim a position equal to metaphysics and theology, the sciences of the eternal. "*Cognitio certitudinalis esse non potest nisi sit ex parte scibilis immutabilitas et infallibilitas ex parte scientiae. Veritas autem creata non est immutabilis simpliciter, sed ex suppositione, similiter nec lux creaturae est omnino infallibilis ex propria virtute, cum utraque sit creata et prodierit de non esse in esse.*"[9]

All this is completely changed in Galileo. Mathematical physics is for him not merely a special branch of "science," it has become the tool, the necessary condition and instrument for any knowledge of truth. Without it there would be no truth for men. All "supernatural" truth which contradicts the conclusions of natural science or attempts to set limits to them is mere appearance. This was the new ideal for which Galileo fought—and it was this fight that led to his condemnation. For him mathematical physics had become a necessary element in his conception of life and of the world, in his interpretation of the universe.

What Galileo introduced and established is a new *hermeneutics*. The theological hermeneutics of the Middle Ages was in possession of the truth in the Holy Scriptures and in the interpretation of the Scriptures given by the Church Fathers. The humanistic hermeneutics knew and recognized no higher authority than that of the classical writers: the comparison of texts gave truth and "was" truth. All this Galileo dismissed with a few epigrams. "This kind of men believe," he wrote to Kepler, "that philosophy is a book like the *Aeneid* or the *Odyssey*, and that the truth is not to be found in the universe or in nature, but (and these are their own words) in the comparison of texts."[10]

[8] Augustine, *De trinitate*, XII, 15.

[9] Bonaventura, *Itinerarium mentis in deum*, *Opera omnia* (1882–1902), V, 293–316.

[10] See further details in my paper, "Wahrheitsbegriff und Wahrheitsproblem bei Galilei," *Scientia* (1937), 121–30, 185–93.

II. The like holds for Kepler's *Astronomia Nova.* It too is completely justified in its title—not only its contents but also its methodology is new. The first point is undisputed: without Kepler's laws Newton would not have been able to construct his system of the world or to write his *Principia.* But neither can the universal philosophical significance of Kepler's work be brought into question. In the recent literature on Kepler there seems to be a strong tendency to emphasize the "mystical" elements in his thought. That there are such elements, and that Kepler is much closer than Galileo to the Neoplatonic and Neopythagorean traditions, is unmistakable. But it is not only an exaggeration, it is absurd, when men like Dietrich Mahnke[11] try to derive his entire science from these ideas. "Mystical" ideas may well have had great influence on Kepler's personal attitude. We find clear traces of them in the *Mysterium Cosmographicum* and in the *Harmonia Mundi.* Even the belief in astrology Kepler seems never to have overcome fully—though he speaks with increasing detachment and often with a clear irony about his own astrological ideas.

But none of this is really significant. The real emancipation is accomplished in Kepler's *work.* And it could be accomplished there only because Kepler stood for a new and stricter *ideal of truth.* Kepler himself tells us that in his first studies of planetary motion he had arrived at an hypothesis which formulated all his observations with sufficient accuracy: the error amounted to only eight minutes, and in accordance with the prevailing opinion of the time could be neglected. But he was not satisfied, and went further: "These eight minutes," he himself says, "became the beginning of the whole new astronomy." It was thus a new demand for "precision" which gave birth to Kepler's laws. And so there grew up a new and stricter scientific critique of all pictorial and symbolic ideas, a clearer recognition of what symbols can and cannot do. *"Ludo quippe et ego symbolis,"* Kepler says in a letter, *"sed ita ludo, ut me ludere non obliviscar. Nihil enim probatur symbolis; nihil abstrusi eruitur in naturali philosophia per symbola geometrica, tantum ante nota accommodantur, nisi certis rationibus evincatur, non tantum esse symbolica, sed esse descriptos connexionis rei utriusque modos et causas."*[12]

III. In conclusion, I should like to touch briefly on another problem that has for some time been at the center of the "Renaissance controversy." Ever since Burckhardt set forth "the discovery of Nature and of Man" in

[11] Dietrich Mahnke, *Unendliche Sphäre und Allmittelpunkt: Beiträge zur Genealogie der mathematischen Mystik* (Halle, 1937). For criticism of this book cf. my article, "Mathematische Mystik und mathematische Naturwissenschaft," *Lychnos* (Annual of the Swedish History of Science Society, Uppsala, 1940), II, 248–65.

[12] Kepler, *Opera Omnia* (*ed.* Frisch), I, 378.

the Renaissance—ever since he explained that the Italian Renaissance was the age "in which Man became an intellectual *Individual* and recognized himself as such"—this thesis has been repeated countless times. Often the so-called "individualism" of the Renaissance has been used as a mere catchword. That this should have called forth the sharpest criticism is easy to understand. Huizinga once said that it is impossible to confine "individualism" to the Renaissance, since figures like Abailard, John of Salisbury, and Wolfram of Eschenbach remain outside its boundaries.

But it is clear that Burckhardt did not intend his thesis in this sense. What he was trying to say was that in the Age of the Renaissance the relative emphasis placed on the "universal" and on the "particular" began to shift. In the scale of values the individual was now assuming another place and another station. I am content to make this clear in a single case, that of Montaigne. Montaigne's *Essais* created a new "philosophy" of the individual. That the portrayal of a particular man *as* a particular man—with all his peculiarities, accidents, and idiosyncrasies—could have a theoretical interest, was recognized by no philosophy before the Renaissance. The portrayal of men gave rise rather to types or "characters"—like the *Characters* of Theophrastus. Montaigne is the first thinker who dares to break with this tradition and who completes the break with full awareness of what he is doing. Augustine was able to set down his private confessions—but a portrait of himself in Montaigne's sense would have seemed to him pure blasphemy. *"Les aultres forment l'homme,"* says Montaigne, *"je le récite et en represente un particulier, bien mal formé . . . Je ne puis asseurer mon object; il va trouble et chancelant, d'une yvresse naturelle: je le prends en ce poinct, comme il est en l'instant que je m'amuse à luy: je ne peinds pas l'être, je peinds le passage, non un passage d'aage en aultre, ou, comme dict le peuple, de sept en sept ans, mais de jour en jour, de minute en minute . . . Chasque homme porte la forme entière de l'humaine condition. Les aucteurs se communiquent au peuple par quelque marque speciale et étrangière; moy, le premier, par mon estre universel, comme Michel de Montaigne, non comme grammairien, ou poète, ou jurisconsulte . . . Au moins j'ay cecy selon la discipline, Que jamais homme ne traicta subjet qu'il entendist, ne cogneust mieulx que je fois celuy que j'ay entreprins; et qu'en celuy là je suis le plus sçavant homme qui vive."*[13] That an author should dare to portray himself in all his peculiarities, particulars, accidents and idiosyncrasies—and that he should nevertheless claim for this portrait a *universal* significance: this is indeed something new with the Renaissance. The consideration of individuality thus acquires an entirely new value. It is no accident that Montaigne's *Essais* was one of Shakespeare's favorite books.

Our controversy as to the orginality of the Renaissance and as to the dividing-line between the "Renaissance" and the "Middle Ages" seems to me in many ways rather a "logical" dispute than one about the historical

[13] Montaigne, "Du repentir," *Essais,* Livre III, chap. 2.

facts. Ideas like "Gothic," "Renaissance," or "Baroque" are ideas of historical "style." As to the meaning of these ideas of "style" there still prevails a great lack of clarity in many respects.[14] They can be used to *characterize* and *interpret* intellectual movements, but they express no actual historical *facts* that ever existed at any given time. "Renaissance" and "Middle Ages" are, strictly speaking, not names for historical periods at all, but they are concepts of "ideal types," in Max Weber's sense. We cannot therefore use them as instruments for any strict division of periods; we cannot inquire at what temporal point the Middle Ages "stopped" or the Renaissance "began." The actual historical facts cut across and extend over each other in the most complicated manner.

Nevertheless the distinction itself has a real meaning. What we can express by it, and what alone we intend to express, is that from the beginning of the fifteenth century onward the *balance* between the particular forces—society, state, religion, church, art, science—begins to shift slowly. New forces press up out of the depths and alter the previous equilibrium. And the character of every culture rests on the equilibrium between the forces that give it form. Whenever therefore we make any comparison between the Middle Ages and the Renaissance, it is never enough to single out particular ideas or concepts. What we want to know is not the particular idea as such, but the importance it possesses, and the strength with which it is acting in the whole structure. "Middle Ages" and "Renaissance" are two great and mighty streams of ideas. When we single out from them a particular idea, we are doing what a chemist does in analyzing the water of a stream or what a geographer does in trying to trace it to its source. No one denies that these are interesting and important questions. But they are neither the only nor the most important concern of the *historian of ideas.*

The historian of ideas knows that the water which the river carries with it changes only very slowly. The same ideas are always appearing again and again, and are maintained for centuries. The force and the tenacity of tradition can hardly be over-estimated. From this point of view we must acknowledge over and over again that there is nothing new under the sun. But the historian of ideas is not asking primarily what the *substance* is of particular ideas. He is asking what their *function* is. What he is studying —or should be studying—is less the *content* of ideas than their *dynamics.* To continue the figure, we could say that he is not trying to analyze the drops of water in the river, but that he is seeking to measure its width and depth and to ascertain the force and velocity of the current. It is all *these* factors that are fundamentally altered in the Renaissance: the dynamics of ideas has changed.

[14] I have tried to analyze and clarify this character in a book that has just appeared, "Zur Logik der Kulturwissenschaften," *Schriften der Universität Gothenburg* (Gothenburg, 1942). A copy of the book is available in the Yale University Library.

Consider a case like that of Pico della Mirandola. In a study recently published in these pages[15] I tried to show that the *problem of freedom* lies at the center of Pico's thought. This is certainly no "new" idea. It belongs with the eternal questions of philosophy, which no philosophic thinker and no theologian can fail to reckon with. But what Pico makes out of this problem—the way in which he sets it in the focus of philosophic and religious concern and follows it as it radiates outward from this focus in every direction—all this was new and profoundly significant. Only this kind of *originality*, it seems to me, can be claimed for the Renaissance. Its great achievements lay much less in the new *content* it created—although that too is infinitely rich—than in the new *energies* it awakened and in the intensity with which these energies acted.

Yale University.

PREPARATION AND INNOVATION IN THE PROGRESS OF SCIENCE

By Francis R. Johnson

A question not directly touched upon by either Dr. Durand or Dr. Baron suggests itself in considering the relative importance of tradition and innovation in the history of Italian science of the fifteenth century—or for that matter, in the history of science of any period. It has to do with how far we are justified in denying originality and primary significance to those periods during which little apparent advance is made in scientific discovery, but which, upon more searching study, reveal themselves as periods of eager assimilation, dissemination, and elaboration of the body of scientific knowledge inherited from the distant and recent past, often with concurrent outside forces spurring men to re-examine the traditional material in a new light. Such periods of apparent quiescence seem to be customary preliminaries to those periods we regard as marked by spectacular innovations.

An apt analogy is the alternation, in a military campaign, of the rapid conquest of vast areas by spectacular advances in the field, with the no less necessary phase during which these advances are consolidated, old units regrouped, new forces brought up, and the ground prepared for the next forward lunge. The military strategist will usually rate this second, less spectacular, phase of a campaign as the more important, demanding greater skill. Unless it is successfully executed, seeming victory is transformed into stalemate or defeat.

Fifteenth-century Italy presents just such a period of consolidation and preparation in the history of science. Both Dr. Durand's and Dr. Baron's papers, emphasizing complementary aspects of recent scholarship, illustrate

[15] This Journal, III, 2 and 3 (April–June, 1942).

that our increased knowledge of the Quattrocento points to this sort of evaluation of its contribution to scientific thought. Dr. Durand, weighing its claims for innovation, rightly finds that its innovations, according to his helpful and lucid classification, consisted primarily in the internal elaboration of traditional substance rather than full mutations. Dr. Baron, on the other hand, justly asserting that the isolated study of the history of science frequently leads us astray, maintains that the Quattrocento's importance for science lies in its transformation of the cultural atmosphere in which scientists worked, and in the emergence of new ways of thought which promoted the mutational changes that were to come later. Thus, whether we fix our attention upon definite increments of scientific knowledge or consider science in relation to other material and intellectual activities, fifteenth-century Italy stands forth neither as a period of spectacular achievement in scientific discovery nor as one in which science was stagnant and neglected. Rather it is an era in which, at universities such as Padua, old material was being subjected to re-examination and elaboration, in which a closer co-operation between the scholar-scientist and the artist-craftsman was being evolved, and in which new political, economic, and social conditions were placing their impress upon scientific thought.

In these respects the conditions in fifteenth-century Italy were in many ways analogous to those in sixteenth-century England. Under the Tudors no great contributions, cited as landmarks in the progress of science, were made before Gilbert's *De Magnete* in 1600. But the entire century was one of alert and growing scientific activity, in which ancient science, as it became available in better texts, was critically re-examined; the manuscripts of medieval scientists like Bacon, Bradwardine, and Grosseteste—to name only English authors—were studied with fresh insight; and the new contributions of Vesalius, Copernicus, and others assimilated soon after they appeared.[1] A closer liaison between the systematized learning of the scholarly scientist and the technological skill of the artisan was fostered by men like Recorde, Digges, Dee, and Gilbert. The merchant companies, such as the Muscovy Company, became patrons and promoters of practical science, and employed some of the ablest scientists as expert advisers. Before the end of the century Thomas Hood, and later the Gresham College professors, were delivering public lectures on science, in English, to the tradesmen and artisans of London. Moreover, just as the fifteenth century in Italy prepared the way for the more obvious achievements of the next century and a half, so in England the sixteenth was the forerunner of Britain's greatness

[1] For studies of scientific activity in Tudor England see especially Sanford V. Larkey, "The Vesalian Compendium of Geminus and Nicholas Udall's Translation," *The Library*, 4th Ser., XIII (1933), 367–94; Francis R. Johnson, *Astronomical Thought in Renaissance England* (Baltimore, 1937); and E. G. R. Taylor, *Tudor Geography, 1485–1583* (London, 1930).

in the seventeenth, the century of Napier, Briggs, Harvey, Boyle, and Newton.

Unless we revive the mystical concept of scientific progress, long since discarded by most historians, which views it wholly in terms of the "unanalyzed creative intuitions" of individual geniuses, innovation will continue to appear, upon fuller investigation, less and less as a sharp break with the past. As our studies proceed, we are impressed with the number and complexity of the factors that must be already present, and in the right state of preparation, before some individual scientist, acting as a catalyst, produces the synthesis that we hail as a spectacular innovation. Galileo is a case in point. The studies of Duhem, Thorndike, and Randall, as Dr. Durand indicates, have minimized the absolute originality of Galileo by emphasizing his indebtedness to his predecessors. Leonardo Olschki, however, in a recent article, insists upon Galileo's originality and independence.[2] His case rests upon the claim that Galileo's transforming idea was a dynamic conception of all physical phenomena, opposed to the older conception of rest as the natural state of all bodies. But this transforming idea would, according to Dr. Baron's analysis, be merely Galileo's intellectual heritage from the Quattrocento, applied to scientific phenomena.

The Quattrocento, therefore, should be assigned a significance of its own in the complete history of science. We fail to do it full justice if, with Thorndike, we compare it adversely with the century that preceded it. Neither should we, because of its fewer positive contributions, rate it inferior to the age that followed. As transmitter and transmuter its rôle was just as indispensable as those of its predecessor and its successor. Its claims for primacy in the history of scientific thought, however, even when shifted from the no longer tenable ground of a sudden break with the middle ages, remain highly doubtful in the light of our present inadequate knowledge. The factors outside the immediate domain of science which Dr. Baron emphasizes so strongly in his reaffirmation of Italian primacy were equally operative in other countries such as England at a slightly later period and with similar results. Like factors may have had an important rôle as precursors of the scientific achievements of the thirteenth and fourteenth centuries in other countries of Europe. Our present information concerning medieval technology, for example, is so slight that it would be hazardous to assert that the architects and builders of the medieval cathedrals left an impress upon scientific thought less important than that produced by the artists and craftsmen of the Italian cities of the fifteenth century.[3] As we move forward in

[2] "The Scientific Personality of Galileo," *Bulletin of the History of Medicine,* XII (July, 1942), 248–73. Olschki's thesis is a restatement, for a more general audience, of that developed by A. Koyré in *Etudes Galiléenes,* Paris, 1939).

[3] On medieval technology see the survey by Lynn T. White, Jr., "Technology and Invention in the Middle Ages," *Speculum,* XV (1940), 141–59; also his forthcoming article on "Natural Science and Naturalistic Art in the Middle Ages."

our studies of the history of science in relation to other aspects of civilization, the Quattrocento, as a period of consolidation of past scientific progress and preparation for the future will most likely be revealed as one of several similar periods in Western thought. As such it should be assigned no less importance, because no longer interpreted as unique.

Stanford University.

THE PLACE OF CLASSICAL HUMANISM IN RENAISSANCE THOUGHT

By Paul Oskar Kristeller

The " problem of the Renaissance," as it has been widely discussed in the last few decades, is largely a pseudo-problem. A complex historical period with a great variety of cross-currents, in which each European country and each field of interest underwent its own particular development, can hardly be interpreted in terms of a brief definition which would at the same time distinguish it from all other periods of history. Such definitions are apt to be too narrow or too broad. The discussion has been further complicated by the tendency of many scholars to take the Renaissance as an imaginary battle-ground on which to fight out contemporary political, social and ideological conflicts, or as a test case for the solution of such meta-historical questions as the possibility and the causes of historical change. On the other hand, there seems no doubt about the distinctive physiognomy of the Renaissance, and the claim that the very existence of "the Renaissance" has to be proved by a satisfactory definition of it, must be rejected. With the same right, we might as well conclude that there was no "eighteenth century," since we are unable to describe its distinctive characteristics in a brief definition. The best procedure would be rather to start with a tentative conception of the Renaissance, and to take this idea as a guiding principle when investigating the actual facts and sources of the period under consideration.

The question which Professor Durand sets out to answer is much more specific: what is the contribution of fifteenth-century Italy to the progress of natural science? I think the question is worth asking, and we must be grateful for the judicious way in which he has presented and evaluated the facts discovered through recent studies in the history of science. He rightly emphasizes the continuity of the university tradition, and at the same time recognizes the importance of the new translations from the Greek, as in the case of Ptolemy's *Geography*. Many other scientific translations, commentaries, and treatises of the fifteenth century are still awaiting a more detailed investigation, and many other branches of science and learning will have to be examined. But most probably Professor Durand's conclusion will be

confirmed, that fifteenth-century Italy brought no basic change in the methods and results of natural science, although it contributed numerous observations and theories in the various fields.

I disagree, however, with the conclusions for the general interpretation of the Renaissance Professor Durand seems to draw from this result. I fully agree with Professor Baron's excellent definition of the relation between the history of science and intellectual history in general, and his emphasis on the powerful influence which important changes in other fields eventually exercised on the development of natural science. The question of tradition and innovation in Renaissance science cannot be definitely settled without taking into consideration the non-professional writers on science, the non-Italian scientists, many of whom were more or less indebted to the Italians, and possibly even the scientists of the sixteenth century who largely reaped what the fifteenth century had sown. Moreover, science has not always occupied that dominating place among the other fields of culture which it has held during the last few centuries of occidental history. We cannot accept the claim that historical changes are unimportant unless they are changes in the field of science or immediately affect science. In the case of the Renaissance, the cultural change did not primarily concern science. Since Burckhardt's conception of the Renaissance is not based on any claim for a basic change in natural science, I do not see how it can be disproved by showing that actually no such basic change in science took place. On the other hand, I agree with Professor Baron that a change did take place in fields other than science, and that this change did influence the development of science, though indirectly and in a later period.

But when I try to answer the question, what kind of change was characteristic of the Renaissance, and especially of fifteenth-century Italy, I find myself less in agreement with Professor Baron than with Professor Durand. I do believe that classical humanism was, if not the only, certainly the most characteristic and pervasive intellectual current of that period. With its merits and with its limitations, humanism pervaded more or less all achievements and expressions of the fifteenth century. When its influence declined in the sixteenth century, its work had been already done. The influence of humanism on science as well as on philosophy was indirect, but powerful. The actual performance of the humanists in these fields was rather poor. But they popularized the entire body of ancient Greek learning and literature and thus made available new source materials of which the professional scientists and philosophers could not fail to take advantage. This was important, because at that time occidental science and thought had not yet reached or surpassed the results of classical antiquity, and hence had still something to learn from the ancients. Moreover, medieval science had developed in definite patterns, and the introduction of new sources and "authorities" eventually prepared the way for new methods and theories.

Those who claim that ancient science was completely known to the Middle Ages are as mistaken as those who deny that it was known at all. At least some of the classical Latin authors became more widely known in the Renaissance, Lucretius, for example. Numerous Greek manuscripts were brought over from the East, and more men were able to read them in the original. Moreover, practically all the Greek texts were translated into Latin by the humanists, many for the first time. The question of how many were translated for the first time and whether the new translations were better or more influential than the extant earlier translations, cannot be settled by dispute, but only by a careful bibliography of the Latin translations from the Greek, which should include the manuscript materials. In the field of philosophy, humanism introduced most of the works of Plato, Plotinus, Epictetus, Diogenes Laertius, Plutarch, Lucian, as well as many works of the commentators on Aristotle and of the Greek Fathers, not to speak of the Greek poets, historians, and orators. In science the contribution may be less impressive, but it has still to be investigated. Archimedes and Hero came at least to be more widely known, and many of the minor mathematicians were translated for the first time. The Latin translations were followed by extensive commentaries, and by translations into the various vernacular languages which reached an even wider public.

The humanists were certainly not the only representatives of science and learning in the fifteenth century. On the one hand, there were the followers of the medieval traditions who carried on the work of their predecessors, especially at the various universities. On the other hand, there were the artists and engineers who through their practical work came face to face with mathematical and scientific problems and sometimes made important contributions, as has been recently emphasized. But in the fifteenth century both of these latter groups were influenced by humanism, as was the general public. If the humanists failed to make substantial contributions to the various fields of traditional learning, they did introduce source materials and problems which could be applied to those fields. By the end of the fifteenth century, humanism had not indeed replaced the traditional learning, but the representatives of traditional learning had absorbed the achievements of humanism. This accounts for the changes and progress which took place in the sixteenth century—just as the achievements of the artists and engineers were taken over by the professional scientists after the middle of that century. On the other hand, even the artists and engineers were subject to the influence of humanism, as Professor Baron rightly emphasizes. The personal relations between the humanists and the artists need further investigation, especially as they appear from numerous letters and poems of the humanists which have not yet been utilized for this purpose. The number of artists and engineers who made active contributions to science was still comparatively small in the fifteenth century as compared with the

sixteenth. But the case of Leon Battista Alberti shows that this scientific activity of the artists cannot be separated from, or opposed to, contemporary humanism.

I cannot agree with those who identify these artists with the general public of the unlearned or who make a sharp contrast between the "Academic" humanists who wrote in Latin, and the "popular" writers who used the vernacular language. Those artists who also wrote scientific treatises certainly had some learning beyond that of the general public, and drew something from the professional learning of their time, whether it was in the medieval or in the humanistic tradition. The humanists themselves, no less than these artists, impressed the popular imagination of their time, as many anecdotes show. Since this was a matter of fashion, no real understanding on the part of the public was required. If today many admire the achievements of modern science without understanding its methods, we may well grant that in the early renaissance many admired the humanists without understanding their Latin. Moreover, the question of language is less important for our problem than might be supposed. In the fifteenth century there is abundant evidence for the mutual influence between vernacular and Neo-latin literature, and when the vernacular definitely won out in the sixteenth century, it had already absorbed the characteristic achievements of humanism, in style, terminology, literary form, and subject matter. Otherwise, it could not have replaced Latin.

To conclude, I should like to add to the statements of Professors Durand and Baron that by popularizing in the fifteenth century the works of classical antiquity, the humanists made an important, though indirect contribution to the development of science and philosophy, and that this contribution bore fruit not only in the work of the humanists themselves, but also in that of the professional scientists and artists of their time and of the following century. All these statements, however, are tentative rather than final, and subject to further revision. The only thing that really counts in Renaissance studies is the actual investigation of the extensive source materials which have not yet been included in any extant synthesis. This investigation must proceed with the cooperation of all scholars interested in the period, regardless of their point of view. In this study we should try to eliminate so far as possible our personal preference for or against this or that nation, language, class, current, or field, and to arrive at a fair evaluation of the contribution each of them has made to the whole of occidental civilization. Such an evaluation will not depend wholly on the influence, direct or distant, which each phenomenon has exercised on later developments, but will also acknowledge the inherent, "absolute" significance of many ideas and achievements which for some reason or other failed to have any visible influence. It is this significance, rather than any incidental

sequence of changes or influences, which in my opinion should be the ultimate purpose of the history of ideas, if not of all history.

Columbia University.

IT IS TIME TO RECOGNIZE A NEW "MODERN AGE"

By Dean P. Lockwood

Prof. Durand argues that "science is fundamental to the modern world," and that inasmuch as Quattrocento Italy made little or no advance in science, the Modern World owes less to the "Italian Renaissance" than is ordinarily supposed. Dr. Baron, commenting on this thesis, has shown, in my opinion, a far broader grasp of the period, and has demonstrated that some of the intangibles, some of the indirect results of intellectual forces, are far more important than Prof. Durand realized. All very interesting! But the most serious defect in Prof. Durand's reasoning is that he fails to define the "modern world." He does not take into account the fact that a *new* Modern Age is well under way.

We are at the beginning, I say, of a new era—the era of the annihilation of global space. It is an era so different from all previous human experience that it will be marked by the most important cleavage in recorded history. It is in this new era, beginning approximately with the twentieth century, that "science is fundamental." To call the Renaissance a prelude to this age is absurd, and to re-define the Renaissance in terms of twentieth-century values is beside the point. The Renaissance was prelude, in most ways that were then considered important, to the *ex*-Modern Age, the now nameless age, the period of the XIV–XIX centuries. We now need a handy designation for this recently-deceased era of western civilization.

Obviously the period since the Renaissance (the period commonly called the "Modern Age") could not have gone on being called the modern age forever. That term is, in the nature of the case, temporary. The Greco-Roman Era was once "the modern"; the Middle Ages were once "modern"; and now the period of the XIV–XIX centuries has receded into the past. It must be ticketed and laid on the shelf. (By the same token, the term "Middle Ages" is now automatically outmoded.) It is therefore time to recognize a new Modern Age.

Future historians may battle over the position of the nineteenth century. Should it be regarded as the last of the old era or the beginning of the new? From my preoccupation during the last few years with the history of medicine—and from the evidence of the "age of inventions"—I am inclined to speculate that the latter half of the nineteenth century will come to be regarded as of the New Era. But I am straying too far from the Renaissance.

The history of medicine—of which Prof. Durand has little to say—hardly supports the now popular theory of the superiority of the thirteenth century over the Renaissance. The evolution of the Science of Medicine is distinct from that of any other field of knowledge and has a simplicity and clarity all its own. Medicine, as we conceive it today—playing, as it does, a supreme rôle in modern life—begins in the nineteenth century. From the time of Vesalius there had, of course, been stirrings, and new forces were slowly gathering headway. But assuredly the medicine of all recorded time before the mid-nineteenth century (i.e., before the advent of antiseptic surgery, anaesthesia, physiological chemistry, *et al.*) falls into one major era.

The Italian Renaissance contributed nothing worth mentioning to the science of medicine. How could it? Renaissance means revival. From the point of view of modern medicine there was nothing in the Greco-Roman world worth reviving. And actually, in the fifteenth and sixteenth centuries, the Greek and Latin medical authors that were recovered and revived were no improvement on Avicenna. If Hippocratic or Galenic medicine had been fully revived in all its purity and perfection, there might have been a slight gain (counterbalanced by the loss of Arabic embellishments); but at best there would have been a difference of degree, not of kind.

The Italian physicians of the fifteenth century (and after) were medieval in their speculations and *primitive* in their practice. The utter abyss, the seeming lack of all connection between their complicated physical and methodological speculations on the one hand, and their pigeon-dung and scorpion-powder therapy for hot and cold, dry and moist, melancholic and phlegmatic "malcomplexions" on the other, is to the modern mind amazing and inconceivable. On the whole the Renaissance contributed nothing to modern medicine; neither did the Middle Ages; neither did the Greeks.

Therein lies just the difference between the attitude of the scientist and that of the humanist toward the Renaissance—or toward the whole past, for that matter! In the humanities—in art, in literature, in philosophy—we still go back to the Greco-Roman world, and to the Renaissance of the Greco-Roman world (and to the Middle Ages as well), for inspiration and even for guidance in the great problems of human life—moral, spiritual, and aesthetic; and we always will. But modern science looks to the past no more. It had its roots in the past, of course; but to trace them is merely to satisfy a curiosity, to pursue an intellectual hobby. The era in which "science is fundamental" has nothing to learn—in science—from the past.

I note an increasing tendency in the scientists of today to scorn the humanities, and to project their scorn of the humanities into the past. Thus past eras are re-evaluated with a new bias. If the classics, these scientists seem to say, are of no value today, how could they have been of value in the past? It is a dangerous argument. In the fifteenth century, when the

revival of classical attitudes was fresh, the classics were a potent force. If the results were indirect, they were none the less real; and Dr. Baron has made a masterly presentation of the subtler influences.

I believe that a more static interpretation of the past, by means of an effort to re-create the atmosphere of the past itself, is a sounder procedure than endeavoring constantly to re-interpret the past in accordance with every variation of contemporary thought.

Haverford College.

RENAISSANCE OR PRENAISSANCE?

By Lynn Thorndike

Professor Dana B. Durand has accused me of harboring a personal antipathy to the Renaissance. Whether my motive is personal or rational, objective or subjective, conscious or sub-conscious, it must be confessed that my aversion to the term in question is even more sweeping than Durand perhaps thinks and extends to such catchwords as the Carolingian Renaissance and the twelfth-century renaissance, as well as to the more often mentioned Italian Renaissance of the fifteenth century or somewhere thereabouts. Religion may have its resurrections and revivals, but I have even less faith than Nicodemus in rebirths or restorations of whole periods of human history. I take my stand with the blind writer of Christian hymns, Fanny Crosby, who sang,

> But the bird with the broken pinion never soared so high again;

with William Muldoon who said of former heavy-weight champions,

> They never come back;

with Omar Khayyam who mused,

> The moving finger writes and having writ
> Moves on; nor all your piety nor wit
> May lure it back to cancel half a line
> Nor all your tears wipe out one word of it;

and with a verse from the light opera, Tom Jones,

> Time is not a necromancer;
> Time's a thief and nothing more.

Legacies from the past? Yes. Inheritances from previous periods? Yes. Survivals? Yes. Resemblances to our forebears? Yes. Reformations? Perhaps. Reactions? Unfortunately. But no rebirths and no restorations!

Books and works of art are about all that remains to us of the past. The latter are all too soon sadly altered, and their restoration, whether by some German professor or by a Thorwaldsen or Viollet-le-Duc, only makes them less like what they originally were. Books remain less changed by the lapse

of time, but even their text may become corrupt, or the meaning of the very words they use alter in the interim. The humanists of the so-called Italian Renaissance had only a bookish knowledge of antiquity; they failed almost as dismally as have Mussolini and his Fascists to make the reality of ancient Rome live again. If, even in our own day, all the resources of the art of history aided by archaeology can give us only a faint and imperfect idea of the past, how can we expect actual renaissances of it or recognize them as such, if they were to occur? At the age of sixty I am perhaps more like myself at the age of twenty than I am like anyone else. But I couldn't possibly put myself back into the frame of mind that I had then. I have a dim recollection of it; my present state of mind is an outgrowth of it; that is all. A girl of eighteen, dressed up in the clothes which her grandmother wore when a girl of eighteen, may look more like her grandmother as she was then than her grandmother herself does now. But she will not feel or act as her grandmother felt and acted half a century or more ago. Much more tenuous is the connection between distant historical periods, and much less likely is it that historians can successfully venture upon glittering generalities about them. Who can evoke from the past more than a wraith, a phantasy, a specter, which murmurs, like the ghost in *Hamlet*, "Historian, remember me!"

It is true that history offers examples of human customs which somewhat resemble the conception of a renaissance. For instance, at Tonalamatl in ancient Mexico the recurrence of the year date 2. acatl every 52 years was considered a critical occasion, it being feared that the sun might fail to rise next day and that the evil spirits might destroy the world and mankind. Accordingly, a festival of ceremonial fire-making was held. All the old fires were carefully extinguished and at midnight on the mountain top the high-priest by rubbing sticks together kindled a new fire on the breast of a prisoner who was forthwith sacrificed. The new fire was then distributed to the temples of the surrounding cities and thence to the adjacent peoples. Old garments were thrown away and household dishes and utensils were broken or freshly painted over in token of the new lease of life given to mankind.[1] But this rekindling and renewal was immediate, continuous, and perfunctory. Only a part of one night intervened between the two periods, not centuries of dark ages. There was no intellectual or spiritual rebirth.

We might also adduce the influence upon our notions of revolutions and periods in history of the astrological theory of conjunctions and revolutions of the planets.

But let us turn to the development of the concept of an Italian Renaissance and begin with the translation into Latin of Ptolemy's *Geography* in the first decade of the fifteenth century. Durand is inclined to censure the previous medieval translators for neglecting this work. If they did—for a

[1] Joyce, *Mexican Archaeology* (1914), 74.

previous translation may have escaped our notice—it is to be remembered that after all the text in question consists largely of lists of ancient place-names, many of which cannot be identified and located with any assurance and are of purely historical and linguistic interest. Moreover, Ptolemy had made the Mediterranean Sea too short by one-third, whereas one of the medieval *portolani* is more accurate than any other map of the Mediterranean until the eighteenth century. Concerning the Far East, too, and islands in the Atlantic the thirteenth and fourteenth centuries were much better informed than Ptolemy. The translation and subsequent vogue of his *Geography* were therefore in some ways regrettable. Be that as it may, in the dedication of his translation to pope Alexander V, Jacobus Angelus, who was a booster of his native town of Florence, says:

> This very age of ours, especially in our city of Florence, has sparkled with how many wits, who to their great glory have resuscitated liberal studies which had grown almost torpid.

In the fifth volume of *A History of Magic and Experimental Science* I have given various examples of this notion of a resuscitation of liberal studies becoming stereotyped and being extended to most inappropriate fields, such as astronomy by Moravus and Santritter, chiromancy and physiognomy by Cocles, anatomy by Vesalius, and magic in the case of Antiochus Tibertus. Abstemius depicted pope Paul III as restoring astrology after it had lain in darkness, disrepute, barbarism and sordid squalor for many centuries past; Pena praised Charles, cardinal of Lorraine, for having resuscitated the prostrate mathematical sciences.[2] Just as the humanists who found manuscripts of the Latin classics in monasteries represented themselves as discovering the work in question and rescuing it from neglect and decay, saying nothing of the fact that the monks had copied it in Carolingian times and preserved it ever since, but leaving their own manuscripts when they died to some monastery as the safest place in which to keep them, so publishers who printed a text for the first time, even if it was a typical product of medieval scholasticism, represented themselves as snatching it from Gothic filth and dust and mildew and cobwebs and bringing it to the light of fairest impressions with the text carefully restored to its pristine purity and freed from barbarisms, when in reality they were very likely using a single inferior manuscript and neglecting a dozen older and superior versions.

When was the word, Renaissance, first used? Nicolaus Prucknerus or Prugner approached such usage when, in the preface to his re-edition of the ancient Roman astrologer, Julius Firmicus Maternus, addressed from Strasbourg on January 28, 1551, to young king Edward VI of England, he spoke of religion reviving in that realm (*una cum renascente religione istius regni*). But evidently he was speaking of the Protestant Reformation.

[2] *A History of Magic and Experimental Science*, V, 334–5, 52–3, 524 and 530, 55, 265, 304.

Two years later, however, the French naturalist, Pierre Belon, in the dedicatory epistle of his *Les observations . . . de plusieurs singularitez* to François cardinal Tournon, assured him that, as a result of his patronage of learning and education of promising young scholars, it had followed that the minds of men, which were formerly as it were asleep and sunk in a profound slumber of long-standing ignorance, had begun to awake, to come forth from the shadows where they had so long dwelt, and to develop in all sorts of good disciplines a happy and desirable Renaissance, like plants that, after the rigors of winter, regain their strength with the sun and sweetness of springtime.[3]

Peter Ramus, in an oration delivered in 1546, made the following vivid contrast between his own and the preceding century. Suppose, he said, a master of a century ago should return to life now, what progress he would discover, how astounded he would be! He would be as surprised as one who, risen from depths of earth, should see for the first time sun, moon and stars shining bright. For then he heard no one speak except in a barbarous and inept manner, while now he would hear countless persons of every age speaking and writing Latin correctly and ornately. Then no one could read Greek, now men not only read it but understand it thoroughly. He used to hear as grammarians, poets and orators, Alexander of Villa-Dei, Facetus, the *Graecismus;* in philosophy, Scotists and followers of Petrus Hispanus; in medicine, the Arabs; in theology, I know not what upstarts. Now he would hear Terence, Caesar, Virgil, Cicero, Aristotle, Plato, Galen, Hippocrates, Moses and the prophets, the Apostles and other true and genuine messengers of the Gospel, and indeed voices in all languages.[4]

Except for the closing allusions to vernacular translations of the Bible, this passage well expresses the original restricted significance of the Renaissance as a purification of Latin diction and grammar, a revival of Greek, and a return from medieval compilers, commentators and originators to the old classical texts. This was all that the revival of learning meant to the Italian humanists of the quattrocento and to their fellows beyond the Alps, and for them it was enough. The mere thought of it aroused in Ramus a

[3] Edition of Paris, 1553, printed by Benoist Prevost, rue Prementel: "De la est ensuivy que les esprits des hommes qui auparavant estoyent comme endormis et detenuz assopiz en un profond sommeil d'ancienne ignorance ont commencé à s'esveiller et sortir des tenebres ou si long temps estoyent demeurez ensueliz et en sortant ont iecté hors et tiré en evidence toutes especes de bonnes disciplines lesquelles à luer tant eureuse et desirable renaissance, tout ainsi que les nouvelles plantes apres saison de l'hyver reprennent leur vigeur à la chaleur du Soleil et sont consolées de la douleeur du printemps."

[4] For the Latin of the passage, which I have rendered freely, see K. Waddington, *Ramus, sa vie, ses écrits* (1858), 304–5. For a very similar attitude by Giovanni Ferrerio, in an academic dissertation published at Paris in 1539, see *Magic and Experimental Science,* V, 295.

grand and glorious feeling of enthusiasm tempered with complacency. He neither sensed any change in the political and economic set-up nor was aware of any alteration in social and moral values.

As the study and reading of Latin and Greek waned, however—and this was partly because the humanists and classicists had substituted a dead for a living language—fewer and fewer persons could sincerely share in this thrill or impart it to others. Such fervor as the concept of the Renaissance still invoked was largely in the realm of the fine arts, where the term had been applied to the post-Gothic period. It was at this juncture that Michelet called the Renaissance "the discovery of the world and of man," and was followed in this lead by the very influential book of Burckhardt, in which, on what seem too often to be dogmatic or imaginary grounds without sufficient presentation of facts as evidence, the Renaissance was no longer regarded as primarily a rebirth of classical learning and culture but rather as a pre-birth or precursor of present society and of modern civilization—"a period," to quote the *Boston Transcript* (February 27, 1926) concerning Elizabethan England, "that witnessed the birth pangs of most that is worth while in modern civilization and government."

This made a well-calculated appeal to the average reader who is little interested to be told that Erasmus was a great Greek scholar or that Leonardo da Vinci copied from Albert of Saxony, but whose ego is titillated to be told that Leonardo was an individual like himself or that Erasmus's chief claim to fame is that he was the first modern man—the first one like you and me. All this was quite soothing and flattering and did much to compensate for one's inability to read Horace or to quote Euripides. It even had its appeal for professors of modern European history and for teachers of the modern languages. It appears to be the concept of the Renaissance which such recent advocates thereof or apologists therefor as Wallace K. Ferguson and Hans Baron are concerned to defend, retreating to new standing ground of plausible hypothesis and ingenious conjecture, when some of Burckhardt's old bulwarks are proved to be untenable by new masses of facts concerning either or both the middle ages and the quattrocento. But would it not make things clearer, if they ceased to employ the old name, since the old concept has been abandoned, and, instead of talking of the Renaissance, spoke of the period or movement or whatever it is they have in mind as the Prenaissance?

With regard to the work of Burckhardt I may perhaps be permitted a few further comments. Of its six parts, the third on the Revival of Antiquity seems to me scholarly and just, recognizing the defects as well as the merits of the Italian humanists and containing many bits of illuminating detail. But most of the political, social, moral and religious phenomena which he pictures as Renaissance seem almost equally characteristic of Italy at any time from the twelfth to the eighteenth century inclusive. The fourth part on the discovery of the world and man uses only popular, not scientific literature, nor may this be dismissed as merely a sin of omission, since else-

where in the volume are such atrocious misstatements as that few works of Aristotle had been translated into Latin by the fourteenth century. By including such personalities as Frederick II and such authors and literary compositions as Dante and the *Carmina burana* within the Renaissance, Burckhardt freed the movement from the embarrassment of chronological limits and made any differentiation between it and medieval culture well-nigh impossible. At bottom this was a wholesome tendency, equivalent to recognition that there is no dividing line between "medieval" and "renaissance" culture, just as most historical museums have a single section labeled "Middle Ages and Renaissance." In general, Burckhardt devoted so much of his pages and energy to the attempt to trace intangibles, such as personality, imagination, passion, spirit, the popular mind, the feeling for this and that, such and such a sentiment, that his book hardly touches the domain of intellectual history and seems to possess a will-o'-the-wisp sort of character.

The attraction which this kind of writing has for many has been well expressed by Professor Schevill in reviewing another book:

> If the modern scientific method, a well co-ordinated plan, and the view-point regarding the character of the social process which obtains among present-day scholars are the indispensable requirements of a good history, it would have to be conceded that Mrs. Taylor's book stands self-condemned. But if there is salvation outside the ruling formulas, if a work may still be history, and good history, when, instead of building up a solid edifice of facts, it occupies itself with the spirit behind the facts in the hope of communicating the color and perfume of a segment of human experience, this book can be confidently recommended not only to the notoriously unscientific lovers of the Renaissance but to those grave and reverend signors, the professional historians themselves.[5]

The trouble is that this kind of writing is almost invariably based upon an insufficient acquaintance with the facts and misinterpretation of them. Of the same genus is another bête-noire of mine, those writers who proclaim that this or that person was far in advance of his time, like Roger Bacon or Leonardo da Vinci.[6] But should you ask them to name a few contemporaries of the person in question who were typical of that time, they would hardly be able to do so.

Was the individual freed and personality enhanced by the Renaissance or Prenaissance? Burckhardt affirmed that with it "man became a spiritual individual and recognized himself as such," whereas "in the middle ages both sides of human consciousness—that which was turned within as that which was turned without—lay dreaming or half awake beneath a common veil."[7] It might be remarked that individualism may be a mark of decline

[5] Review of Rachel Annand Taylor, *Aspects of the Italian Renaissance: American Historical Review*, XXIX (October, 1923), 122.

[6] Durand has recognized this antipathy, too, in reviewing my fifth and sixth volumes in *Isis*, XXXIII (June, 1942), 691–712, especially 702–3, 704–6.

rather than progress. The self-centred sage of the Stoics and Epicureans rang the knell of the Greek city-state. Basil, on the verge of the barbarian invasions, complained that men "for the greater part prefer individual and private life to the union of common life."[8] Carl Neumann held that "true modern individualism has its roots in the strength of the barbarians, in the realism of the barbarians, and in the Christian middle ages."[9] Cunningham believed that the Roman Empire "left little scope for individual aims and tended to check the energy of capitalists and laborers alike," whereas Christianity taught the supreme dignity of man and encouraged the individual and personal responsibility. Moreover, in the thirteenth century there were "fewer barriers to social intercourse than now."[10] According to Schäfer, "So far as public life in the broadest sense, in church and state, city and country, law and society, is concerned, the middle ages are the time of most distinctive individuality and independent personality in volition and action."[11] We may no longer think of the Gothic architects as anonymous, and de Mely discovered hundreds of signatures of miniaturists hidden in the initials and illuminations of medieval manuscripts.[12] No period in the history of philosophy has discussed individuality and its problems more often or more subtly than did the medieval schoolmen. Vittorino da Feltre and other humanist educators may have suited their teaching to the individual pupil; at the medieval university the individual scholar suited himself. The humanists were imitative in their writing, not original. Vitruvius was the Bible of Renaissance architects who came to follow authority far more than their creative Gothic predecessors. For the middle ages loved variety; the Renaissance, uniformity.

Not only has it been demonstrated that the thirteenth and fourteenth centuries were more active and penetrating in natural science than was the quattrocento,[13] but the notion that "appreciation of natural beauty" was "introduced into modern Europe by the Italian Renaissance"[14] must also be abandoned. Burckhardt admitted that medieval literature displayed sympathy with nature, but nevertheless regarded Petrarch's ascent of Mount

[7] English translation (1890), 129.

[8] *Hexaemeron*, VIII, 7.

[9] "Byzant. Kultur u. Renais. Kultur," *Historische Zeitschrift*, XCI (1903), 215–32; translated in Munro and Sellery, *Medieval Civilization*, 524–46.

[10] *Western Civilization in Its Economic Aspects*, II (1910), 8 *et seq.*, 2.

[11] "Zur Beurtheilung des Wormser Concordats," *Philos. u. Hist. Abhandl. d. kgl. preuss. Akad. d. Wiss.* (1905), 94.

[12] F. de Mely, *Les primitifs et leurs signatures: les miniaturistes* (1913).

[13] In addition to the bibliography given by Durand may be noted "Science in the Renaissance," by George Sarton, in *The Civilization of the Renaissance* (Chicago, 1929), 75–95. As Dr. Sarton remarks, "From the scientific point of view the Renaissance was *not* a renaissance."

[14] J. E. Spingarn, *A History of Literary Criticism in the Renaissance* (1899), 226.

Ventoux (which is only 6260 feet high) in 1336 as epoch-making. Petrarch represented an old herdsman who had tried in vain to climb it fifty years before as beseeching him to turn back on the ground that he had received only torn clothes and broken bones for his pains and that no one had attempted the ascent since. As a matter of fact, Jean Buridan, the Parisian schoolman, had visited it between 1316 and 1334, had given details as to its altitude, and had waxed enthusiastic as to the Cevennes. So that all Petrarch's account proves is his capacity for story-telling and sentimental ability to make a mountain out of a molehill. Miss Stockmayer, in a book on feeling for nature in Germany in the tenth and eleventh centuries, has noted various ascents and descriptions of mountains from that period. In the closing years of his life archbishop Anno of Cologne climbed his beloved mountain oftener than usual.[15]

As for the feeling for nature in medieval art, let me repeat what I have written elsewhere anent the interest displayed by the students of Albertus Magnus in particular herbs and trees.[16]

This healthy interest in nature and commendable curiosity concerning real things was not confined to Albert's students nor to "rustic intelligences." One has only to examine the sculpture of the great thirteenth-century cathedrals to see that the craftsmen of the towns were close observers of the world of nature, and that every artist was a naturalist too. In the foliage that twines about the capitals of the columns in the French Gothic cathedrals it is easy to recognize, says M. Mâle, a large number of plants: "the plantain, arum, ranunculus, fern, clover, coladine, hepatica, columbine, cress, parsley, strawberry-plant, ivy, snap-dragon, the flower of the broom and the leaf of the oak, a typically French collection of flowers loved from childhood."[17] *Mutatis mutandis,* the same statement could be made concerning the carved vegetation that runs riot in Lincoln cathedral. "The thirteenth-century sculptors sang their *chant de mai.* All the spring delights of the Middle Ages live again in their work—the exhilaration of Palm Sunday, the garlands of flowers, the bouquets fastened on the doors, the strewing of fresh herbs in the chapels, the magical flowers of the feast of Saint John—all the fleeting charm of those old-time springs and summers. The Middle Ages, so often said to have little love for nature, in point of fact gazed at every blade of grass with reverence."[18]

[15] Gertrud Stockmayer, *Über Naturgefühl in Deutschland im 10. und 11. Jahrhundert* (1910), 38 *et seq.* For further bibliography on feeling for nature in the middle ages consult Paetow, *Guide to the Study of Medieval History* (revised edition, 1931), 463, which, however, does not mention B. Q. Morgan, *Nature in Middle High German Lyrics* (1912).

[16] *Magic and Experimental Science,* II, 536–37.

[17] Émile Mâle, *Religious Art in France in the Thirteenth Century,* translated from the third edition by Dora Nussey (1913), 52.

[18] *Ibid.,* 53.

It is not merely love of nature but scientific interest and accuracy that we see revealed in the sculptures of the cathedrals and in the note-book of the thirteenth-century architect, Villard de Honnecourt,[19] with its sketches of insect as well as animal life, of a lobster, two parroquets on a perch, the spirals of a snail's shell, a fly, a dragonfly, and a grasshopper, as well as a bear and a lion from life, and more familiar animals such as the cat and swan. The sculptors of gargoyles and chimeras were not content to reproduce existing animals but showed their command of animal anatomy by creating strange compound and hybrid monsters—one might almost say, evolving new species—which nevertheless have all the verisimilitude of copies from living forms. It was these breeders in stone, these Burbanks of the pencil, these Darwins with the chisel, who knew nature and had studied botany and zoology in a way superior to the scholar who simply pored over the works of Aristotle and Pliny. No wonder that Albert's students were curious about particular things.

Finally, can we accept the altered concept of a Prenaissance as the vestibule to modern times and seed-bed of the modern spirit? Chronologically, perhaps. But, aside from the circumstance that modern times and spirit seem at present to be swiftly shifting, are not our political, economic, charitable, educational and ecclesiastical institutions quite as much an outgrowth from medieval life? Without attempting here to argue this larger question, I would merely recall that medieval men coined the word, modern, and regularly spoke of themselves or the last generations of themselves as such. "Maurus, Matthew, Solomon, Peter, Urso are modern physicians through whom reigns the medicine of Salerno."[20] About 1050 Berengar of Tours was accused of "introducing ancient heresies in modern times";[20a] about 1108 Hugh of Fleury wrote his *Historia moderna*. "On all sides they clamor," wrote John of Salisbury in the twelfth century, "what do we care for the sayings or deeds of the ancients? . . . The golden sayings of the ancients pleased their times; now only new ones please our times."[21] When in the next century Robertus Anglicus composed his treatise on the quadrant, it was called *Tractatus quadrantis secundum modernos*. But then improvements were made in the quadrant and Robert's work became *Tractatus quadrantis veteris*.[22] Even scholastic philosophy had its *via moderna* as well as *via antiqua*.[23]

[19] Published in facsimile at London (1859), and Paris (1908).

[20] Epilogue to a *Regimen Salernitanum* in Sloane MS. 554, f. 155, at the British Museum; S. de Renzi, *Collectio Salernitana*, V, 139.

[20a] *Soc. Hist. Franc.*, 50 (1884), 75.

[21] Hauréau, *Notices et Extraits*, III, 216, quoting the *Entheticus*.

[22] Duhem, *Le sytème du monde*, III, 306.

[23] The ancients were the thirteenth-century thinkers before William of Ockham, the moderns his followers. See "modern" in the indices of *Magic and Experimental Science*, vols. II–IV, for other examples of medieval use of the word.

The concept of the Italian Renaissance or Prenaissance has in my opinion done a great deal of harm in the past and may continue to do harm in the future. It is too suggestive of a sensational, miraculous, extraordinary, magical, human and intellectual development, like unto the phoenix rising from its ashes after five hundred years. It is contrary to the fact that human nature tends to remain much the same in all times. It has led to a chorus of rhapsodists as to freedom, breadth, soaring ideas, horizons, perspectives, out of fetters and swaddling clothes, and so on. It long discouraged the study of centuries of human development that preceded it, and blinded the French *philosophes* and revolutionists to the value of medieval political and economic institutions. It has kept men in general from recognizing that our life and thought is based more nearly and actually on the middle ages than on distant Greece and Rome, from whom our heritage is more indirect, bookish and sentimental, less institutional, social, religious, even less economic and experimental.

But what is the use of questioning the Renaissance? No one has ever proved its existence; no one has really tried to. So often as one phase of it or conception of it is disproved, or is shown to be equally characteristic of the preceding period, its defenders take up a new position and are just as happy, just as enthusiastic, just as complacent as ever.

> You may break, you may shatter the vase, if you will,
> But the scent of the roses will hang round it still.

Still lingers the sweet perfume of the Renaissance; still hovers about us the blithe spirit of the Prenaissance.

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SWIFT'S *MODEST PROPOSAL:*

THE BIOGRAPHY OF AN EARLY GEORGIAN PAMPHLET

By George Wittkowsky

There is an almost complete absence of sustained scholarship on the subject of Swift's *Modest Proposal.* The lesser works even of most major writers in English have been investigated with Gestapo-like thoroughness. Even the minor works of minor writers have received loving attention. And yet toward the *Modest Proposal,* a major work by a major English writer, scholars have been definitely coy. One searches in vain for a serious critical article on this pamphlet. No book on Swift which I have read has dignified it with a separate chapter. The usual practice in such books is to write a sentence or two of superlative praise: the rest, for the most part, is silence. The agnostic comment of Bertram Newman may be taken as the theme-song of most critics. Before the *Modest Proposal,* he says, "comment is dumb; . . . there is nothing with which to compare it."[1] Leslie Stephen, who happens to have written some of the most perceptive of all comments on the *Modest Proposal,*[2] really devotes to the subject less than two pages; while Churton Collins spares only one sentence.[3] Although Taine observes that it deserves quotation almost as a whole, because he knows nothing like it in all literature, all he adds by way of critical comment, after extensive quotation, is the remark that beside the *Modest Proposal,* the cries and anguish of Pascal are faint.[4] Taine's compatriots, Legouis and Cazamian, in their distinguished study of English literature, do not even mention it. Quintana asserts that in this tract Swiftian irony "attained its most perfect expression";[5] that it is "not only the greatest of Swift's Irish tracts; it is also the best introduction to his satiric

[1] Bertram Newman, *Swift* (Boston, 1937), 345.

[2] Leslie Stephen, *Swift* (London, 1903), 166–7.

[3] John Churton Collins, *Jonathan Swift* (London, 1893), 223.

[4] H. A. Taine, *History of English Literature,* translated by H. Van Laun (New York, 1872), II, 147–9.

[5] Ricardo Quintana, *The Mind and Art of Jonathan Swift* (Oxford, 1936), 255.

art.'"[6] Yet if Quintana's five scattered references to the *Modest Proposal* were brought together,[7] they could be printed on one page.

And yet this neglect, possibly unparalleled in English literary studies, can be simply explained. Critics of the *Modest Proposal,* with few exceptions,[8] have regarded this tract as satire directed against conditions in Ireland rather than against a set of theories and attitudes which rendered such conditions possible. In a moment of crisis, President Grover Cleveland once growled that the country was facing a condition, not a theory. Swift, on the other hand, in writing the *Modest Proposal,* was contemplating theories as well as a condition. Why have scholars ignored or dealt inadequately with the theoretical background of the *Modest Proposal?* Simply because the economists themselves, until very recently, have ignored or treated lightly economic thought before Adam Smith. With the exception of a lone scholar here and there, they seem to have regarded economic theory before the publication of *The Wealth of Nations* as a sort of Miltonic chaos, "a vast vacuity." Mercantilist theories about labor, with which we are chiefly concerned in this chapter, remained, for many generations, particularly obscure. Furniss, who has done much to clear up this obscurity, has offered a cogent explanation for its existence. He points out that there have been semantic barriers. "Habitual use of words in certain meanings," he says, "closes the mind to the reception of their connotations."[9] It is hard for two people with different points of view to reach an agreement on terms. This difficulty is magnified when we try to comprehend the theories of a remote age, "cut off still more completely by a revolution in economic, political and social institutions." Under such circumstances, it is "a positive disadvantage" if a common language has served to convey the thought of both periods. "This semantic barrier," Furniss says, "is the source of most of the difficulty of understanding the position of labor in the eighteenth century."[10]

[6] *Ibid.,* 346.

[7] *Ibid.,* 24, 43, 255, 346, and 355.

[8] These exceptions occur in incidental remarks, several of which are quoted in subsequent notes. No writer on Swift, however, has written a serious *critique* of the *Modest Proposal.*

[9] Edgar S. Furniss, *The Position of the Laborer in a System of Nationalism. A Study in the Labor Theories of the Later English Mercantilists* (Boston and New York, 1920), 25.

[10] *Ibid.,* 75.

Since most political economists ignored mercantilist theory, it is not surprising that writers on English literature have followed their lead. And if one regards the *Modest Proposal* simply as a criticism of conditions, about all one can say is that conditions were bad and that Swift's irony brilliantly underscored this fact.

A comment by Sir Henry Craik on the Irish Manufacturers tract of 1720 will go far toward explaining why the *Modest Proposal* has received such short shrift. Swift's idea of excluding English goods was, he writes, "faulty in political economy," *concerning which the age knew little.* "Swift cared nothing for it. He anticipated its maxims only to ridicule them."[11] With Craik's first proposition one can easily agree. In fact, this tract was written at a time when Swift knew little about contemporary economic theory. But Craik goes further: he assumes not only that Swift knew little about political economy in 1720—or later—but that there was then no such body of knowledge. Yet Craik is one of the most perceptive of all writers on Swift!

But the recent work of scholars like Furniss, Heckscher, and Johnson has blasted the notion that the theories of the early economists are unworthy of study, and the rise of so-called "neo-mercantilism" in Europe during our own generation has stimulated interest in the writings of "the predecessors of Adam Smith." So it may be said that, in a sense, the rise of Mussolini, Stalin, and Hitler has made inevitable, sooner or later, a re-examination of the works of Jonathan Swift.[12] On no work by Swift will the new economic scholarship throw more light than on the *Modest Proposal.*

My analysis of this Swiftian masterpiece must be preceded by an exposition of certain economic terms and tendencies of the Age of Mercantilism. At the risk of over-simplification, I shall divide the discussion of theories of labor in the eighteenth century into four parts. The first, which might be called "The Theory of the Utility of Poverty," will deal with the tendency to regard

[11] Sir Henry Craik, *The Life of Jonathan Swift* (London, 1882), 342.

[12] Joseph Lecler, in an article entitled "Libéralisme Economique et Libre Pensée au XVIIIe Siècle: Mandeville et La Fable des Abeilles," *Études* (Paris, March 22, 1937), 624, opens with this statement: "Par un singulier retour des choses, notre époque voit refleurir, en politique économique, les idées anciennes de protectionnisme et réglementation."

labor, including child labor, as a commodity; the second, which could appropriately be headed "Political Arithmetic," with the application of statistics to problems of population and labor; the third, to which the title "The Able and the Impotent Poor" is applicable, will be concerned with a vital modification of the early mercantilist position that people are the riches of a nation; the fourth, for which the title "Project Concerning Population" comes to mind, will deal with a special type of project.

Fundamental is the tendency to regard labor as a commodity. Under the then dominant bullionist theory, it was assumed that in the exchange of goods between nations, it was impossible for both countries to profit; that for one nation to gain or (as the early economic writers phrased it) to maintain "a favorable balance of trade," it was necessary for it to sell manufactured goods in exchange for raw material. (The phrases used in contemporary tracts were "artificed goods" or "wrought goods.") In other words, the maintenance of "a favorable balance of trade" depended on the exportation of the products of the combined laboring force of a nation. Implicit in this theory was the assumption that the economic good of the state overshadowed the welfare of the individual. It was a philosophy of economic statism which regarded labor as a commodity. Naturally, such a point of view led to several brutal conclusions. It led, in the first place, to the conclusion that the wealth of a nation depended on a numerous population or—as contemporary writers had it—that people are the riches of a nation. It led to faith in an economy of low wages. The more people are paid, to use Heckscher's pithy restatement of this view, the less they work.[13] This was the philosophy which Furniss had in mind when he coined the expressive phrase, "the doctrine of the utility of poverty."[14] Thomas Mun had written in 1664 that "penury and want do make a people wise and industrious."[15] In his essay on "Charity and Charity Schools," published for the first time in the edition of *The Fable of the Bees* which appeared in 1723, Mandeville said that "in a free Nation where Slaves are not allow'd of, the surest Wealth consists in a Multitude of laborious Poor," who should serve as nurseries of

[13] Eli F. Heckscher, *Mercantilism* (London, 1935), II, 165.

[14] *Ibid., passim.*

[15] Thomas Mun, *England's Treasure* (London, 1684), 182.

fleets, armies, and industry.[16] Not only should they be poor: "To make the Society happy and People easy under the meanest Circumstances," he argued, "it is requisite that great Numbers of them should be Ignorant as well as Poor."[17] Heckscher points out that the logic of such a position is belief in "wealth for the nation, but wealth from which a majority of the people must be excluded."[18] It must be remembered that this grim mercantilist outlook was a comparatively recent development and that memories of a more humane philosophy lingered in the minds of men who had read the sermons and tracts written a generation or so earlier.[19] But, by the beginning of the eighteenth century, the view that poverty was caused primarily by low wages had fallen into disrepute.[20] Writers and statesmen were exasperated by idleness in the face of the great need for industrial labor.[21]

Particularly important for an understanding of the background of the *Modest Proposal* is a consideration of the prevailing attitude toward child labor. It has been observed that no aspect of mercantilism is more peculiar from the modern point of view.[22] "In the mercantilist view no child was too young to go into industry."[23] In his essay on charity, Mandeville scorned "the Enthusiastick Passion for Charity-Schools."[24] He spoke of the "unreasonable Vein of Petty Reverence for the Poor," arising from "a mixture of Pity, Folly and Superstition."[25] In his description of England

[16] Kaye edition, I, 287.

[17] *Ibid.*, I, 288.

[18] Heckscher, *op. cit.*, II, 165.

[19] John Bellers, who perhaps is not a fair example, because he was much more humane in his philosophy than most, in his *Essay About the Poor*, published in 1699, spoke eloquently for the laboring people. I have no evidence that Swift read Bellers. It is important, however, to remember that before the tribe of Mandeville and Defoe others had written about the humble in a more humane spirit.

[20] Dorothy Marshall, *English Poor in the Eighteenth Century* (London, 1926), 30.

[21] *Ibid.*, 31.

[22] Heckscher, *op. cit.*, II, 155.

[23] *Ibid.*, II, 155. Heckscher also makes this comment: "Whereas from the beginning of the nineteenth century onward . . . measures were taken to limit child labour by law, under mercantilism the power of the state was exerted in precisely the opposite direction." *Ibid.*, II, 155.

[24] *Fable of the Bees*, Kaye edition, I, 268.

between 1724 and 1726, Daniel Defoe mentions (with what strikes Heckscher as approval) sections like Taunton where children of four or five could earn a living.[26] The first point, then, to keep in mind about the position of labor in the Age of Swift is that the somewhat more humane attitudes of an earlier day had all but disappeared and the laborer had come to be regarded as a commodity.

This somewhat general exposition of the position of labor in the early eighteenth century should be followed by a discussion of the rise of the science of statistics. This calls for a brief survey of theories regarding population. The great name among writers on population is, of course, Thomas Robert Malthus, who proclaimed in his *Essay on the Principles of Population* that people increase by geometrical proportions, sustenance by arithmetical proportions only. Before Malthus, two main streams of English opinion are discernible. During the latter part of the sixteenth century and the first half of the seventeenth, writers on the subject were influenced by fear of overpopulation.[27] Sir Walter Raleigh, for example, feared that the world would not only be full but overflowing were it not for abstinence, artificial sterility, hunger, pestilence, and crime.[28] Bacon sounded a similar warning.[29] But a reversal in point of view coincided roughly with the rise of mercantilism. Thus Sir William Petty wrote that "Fewness of people, is real poverty."[30] Sir Josiah Childs and Charles Davenant expressed similar views.[31] Swift was familiar with the writings of all three. It is remarkable, comments Furniss, that the fear of too small a population should have existed in the midst of poverty. Moreover, it is important for us to realize how influential these mercantilist theories of population were—both in England and elsewhere. One writer observes that if we "turn over the

[25] *Ibid.*, I, 311.

[26] Heckscher, *op. cit.*, II, 156.

[27] C. E. Stangeland, *Pre-Malthusian Doctrines of Population* (1904), 110.

[28] Sir Walter Raleigh, *History of the World*, Bk. i, ch. viii, sec. 4.

[29] Francis Bacon, "Essay Concerning Seditions and Troubles," *Works* (Boston, 1860), XII, 127.

[30] Sir William Petty, *Economic Writings*. Edited by C. H. Hull, 2 vols. (Cambridge, 1899), II, 393–4.

[31] Furniss, *op. cit.*, 30.

dusty and numberless volumes in which the chaos of European legislation is comprised," we shall find that all governments have encouraged young people to marry and parents to raise families.[32] The unpredictable Bernard Mandeville, on the other hand, followed the minority view and argued amusingly that there was a real danger of excessive population and that this excess would be unavoidable were it not for physicians and apothecaries, wars by sea and land, wild beasts, hangings and drownings.[33] On this general position, at least, Mandeville and Swift were in agreement, as we shall presently see.

The new fear of lack of adequate population arose partly from the theory that people are the riches of a nation, partly from a change in actual conditions, and partly from a new and faulty science of statistics.[34] The chief factual elements which encouraged the belief that England was facing a shortage in population were three-fold. The plagues of the seventeenth century had decreased the population[35] at the same time that both expanding foreign trade and insistence on the necessity for exporting "artificed" or "wrought" goods increased the demand. So great was the shortage at one time that criminals in Wales were pardoned on condition that they work in mines.[36]

But the student of Swift's *Modest Proposal* will be chiefly concerned with the third factor: the rise of the science of statistics and its application to problems of population, particularly in

[32] Stangeland, *op. cit.*, 120, quoting Filangieri, *Science of Legislation* (London, 1792), 19. It is curious to what extent the dominant mercantilist point of view went. Late in the century, after Swift had done his work, Frederick the Great wrote Voltaire that he "regards men simply as a herd of deer in the park of a great noble, which has no other function than to people, and fill the enclosure." Quoted by Stangeland, *op. cit.*, 131.

[33] Bernard Mandeville, *The Fable of the Bees* (London, 1739), III, 280.

[34] The change in conditions and the rise of the science of statistics account, in a large measure, for the tenacity with which writers clung to the theory that people are the riches of a nation. So perhaps the second and third factors should be regarded as fundamental.

[35] Guy Chapman, *Culture and Survival* (London, 1940), 18.

[36] *Ibid.*, 50. Chapman observes that "the ceaseless plaints of economic pamphleteers in the early eighteenth century, that the poor are lazy, idle and dissolute, point rather to the inability than to the unwillingness of labour to respond to the offers of *capital*." *Ibid.*, 31.

Ireland. Wesley C. Mitchell has called attention to the unsatisfactory nature of statistical knowledge on population in the eighteenth century.[37] For example, during Adam Smith's lifetime, Dr. Richard Price was demonstrating that the population of England had declined since the Revolution of 1688, while Arthur Young was pointing out that it was rapidly rising.

Political Arithmetic, which has been called "the taproot of modern statistics," originated "in the scientific spirit fostered in England . . . by the Royal Society."[38] It may be said to date from the publication by John Graunt in 1662 of a small book entitled *Natural and Political Observations.* This early attempt to analyze population statistically has been characterized as crude and defective, but "informed by the spirit of modern science."[39] The name "Political Arithmetic" was given to the embryonic science by Sir William Petty, who is of particular interest to us not only because he increased the popularity of Political Arithmetic, but especially because he applied the new methodology to Ireland. In 1652 this Englishman was appointed physician general of the army in Ireland and was directed to make a survey of the forfeited estates of Irish landlords. Thus he became somewhat familiar with the Irish scene. In 1672 he published his *Political Anatomy of Ireland,* in which he made his first attempt to set up as an authority on statistics. In laying the foundation for a discussion of Petty's probable influence on Swift, it is important to observe that he was the first to apply the statistical method to Ireland. Observe also the callous excuse he gave for using Ireland as a guinea-pig. In his preface to *The Political Anatomy of Ireland* he wrote:

> As Students in Medicine, practice their inquiries upon cheap and common Animals, and such whose actions they are best acquainted with, and where there is the least confusion and perplexure of Parts; I have chosen Ireland as such a Political Animal, who is scarce Twenty years old.[40]

Petty's writings, important though they were as forerunners

[37] Wesley C. Mitchell, unpublished lecture notes.

[38] Walter F. Willcox, "Statistics," in *Encyclopaedia of the Social Sciences* (New York, 1937), VII, 357.

[39] *Ibid.*, 357.

[40] Petty, *Economic Writings,* Hull edition, I, 129.

of modern statistics, were nevertheless excessively faulty.[41] Men like Petty were, as Davenant phrased it, "Beginners of an Art not yet Polish'd."[42] One effect of the rise of political arithmetic was the intensifying of the tendency to regard human beings as commodities. Petty not only gave figures concerning the value of property, but even attempted to estimate the "value" of the population, as part of the aggregate national wealth.[43]

We can now turn to another aspect of the theoretical background of the *Modest Proposal.* It is important to understand the distinction once made between the "able" and the "impotent" poor. The Elizabethan Poor Laws, enacted when Englishmen still felt a sense of responsibility toward the unfortunate, divided objects of public charity into three groups: the aged and impotent, children, and persons able to work but unemployed.[44] Meanwhile, the mercantilists, who had first proclaimed that people are the riches of a nation, later qualified this maxim by asserting that only the portion of the population which was usefully employed was the national wealth.[45] Hence during the Age of Mercantilism writers tended to think of the aged, very young children and other unemployable persons as "the impotent poor," and to classify those capable of performing useful labor, whether children or adults, as "the able poor." Meanwhile the prevailing English attitude toward charity had undergone a profound change. In

[41] Hull says that they were based on "a few scattering bills from Paris and Dublin, haphazard returns from various tax offices, a guess here or there," and that Petty himself realized the incompleteness of his data. *Ibid.,* I, lxvi.

[42] Charles Davenant, *An Essay upon the Probable Methods of Making a People Gainers in the Ballance of Trade* (London, 1699), 3.

[43] Heckscher, *op. cit.,* II, 190.

[44] Although Ireland did not actually have a law providing directly for the poor until well into the nineteenth century, earlier statutes nevertheless make the distinction between "able" and "impotent" poor which we find in English and Scottish legislation. Sir George Nicholls, *A History of the Irish Poor Law* (London, 1856), 12 ff. A law passed in the early seventeenth century entitled "An Act for the Erecting of Houses of Correction, and for the Punishment of Rogues, Vagabonds," etc., spoke, for instance, of palmists, bear wards, common players of interludes "and common labourers being able in body, using loytering, and refusing to work for such reasonable wages as is taxed and commonly given." *Ibid.,* 27 ff. The provisions of the Elizabethan Poor Law referred to are found in *43 Eliz. C. 2.* See Marshall, *op. cit.,* 23.

[45] E. A. J. Johnson, *Predecessors of Adam Smith* (1937), 281.

the late seventeenth and in the eighteenth century, as Dorothy Marshall points out, the religious aspects of poor relief all but disappeared.[46] Moreover, throughout the eighteenth century the poor rates were going up, despite the great increase in national prosperity. This the writers on economic questions could not understand. Consequently, "a new bitterness superseded the old sense of responsibility towards the Poor"[47]—a bitterness which will be familiar to readers of Defoe's *Giving Alms No Charity.*

Grimly the tracts of the time harped on the distinction between the "able" and the "impotent" poor. Charles Davenant, whose pamphlets found a place on Swift's shelves, referred to King's division of all Englishmen into two principal classes, the 2,675,520 heads who increase the wealth of the kingdom and the 2,825,000 heads who decrease it. The sick and impotent, beggars and vagrants, Davenant says, "are nourish'd at the Cost of Others; and are a Yearly Burthen to the Publick."[48] It would be difficult to find a more striking commentary on the prevailing attitude toward "the impotent poor" than Petty's remark, after giving figures concerning losses from the plague, that he regretted that the plague unfortunately made no distinction between "the bees and the drones," but destroyed "promiscuously."

Although the *Modest Proposal* contains remarks about several categories of impotent poor, it deals chiefly with one category—children too young to work. It is therefore important that we note the provision in the Irish law passed during the reign of the first George, which classified unemployable children as impotent poor. The act declares that since there are everywhere numbers of helpless children who are forced to beg in order to live and who, unless some care is taken of their education, will become *"not only unprofitable but dangerous to their country,"*[49] therefore power is given to the ministers to bind out these children to tradesmen, provision being made to prevent cruel treatment.[50]

[46] Dorothy Marshall, *op. cit.*, 19.

[47] *Ibid.*, 22.

[48] Davenant, *op. cit.*, 49–50.

[49] Dorothy Marshall remarks: "Despite the growth of the Charity School movement, charity to children in the seventeenth and eighteenth centuries meant enabling them to earn their own living at the earliest possible moment, no matter how laborious their life might be." *Op. cit.*, 24.

[50] Nicholls, *op. cit.*, 40, citing *2nd George 1st, C. 17.*

Finally, we must consider a special aspect of the mercantilist enthusiasm for projects. During the late seventeenth and early eighteenth centuries, as we have seen, the "lust for enterprise and adventure" caused an epidemic of what Dr. Johnson defined as "wild, unpracticable schemes" to break out in England. The enthusiasm of a commercially reckless era for enterprises chartered to enable ships to sail against the wind, to cure venereal diseases, to empty buildings euphemistically called "necessary houses," and to import jack-asses from Spain to improve the breed of British mules reached a climax with the bursting of the South Sea Bubble in 1720. But I am concerned here particularly with a species of projects having as their objects the solution of problems of population and labor, which Swift satirized in the *Modest Proposal* with even fiercer irony than he had employed earlier in tracts and poems aimed at commercial projects and in his attack on both scientific and commercial projects in the Lagado portions of *Gulliver*.

Despite the callous attitude of the period toward poverty, the age was unable to escape from problems which it brought about. Consequently, during Swift's lifetime, England and Ireland were flooded with literature dealing with theories about population, labor, unemployment and poor relief. Furniss observes that a major portion of this literature discussed projects for increasing England's population.[51] One of the most astounding types of project born of this commercial, speculative age, so insistent on placing the economic welfare of the state ahead of that of the individual, involved the idea of running the poor through a joint-stock company. Indeed, not all of these schemes for a joint-stock company came from ruthless advocates of "business first." Sir Josiah Childs, one of the most humane of the writers roughly identified as "mercantilist," was among the first to advance such a scheme. The underlying plan behind most of these enterprises was to incorporate a company to manage all the poor, "impotent" and "able" alike, and to manage them for a profit.[52] Thus did the

[51] Furuniss, *op. cit.*, 36. "The Labour of the Poor is the Treasure of the Rich, was a porverb freely quoted, but it was feared that the poor might cease to labour, and so destroy the trade upon which English prosperity was built." Dorothy Marshall, *op. cit.*, 34.

[52] Dorothy Marshall, *op. cit.*, 43.

commercial pattern of the age fasten itself even upon schemes for solving problems of poverty. Thus did the poor, formerly regarded as fellow-countrymen, come to be regarded as "a distinctive species, a sect apart."[53] For the most radical of such projects, however, perhaps the laurel goes to Sir William Petty. This political arithmetician, fanatically wedded to the notion that people are the riches of a nation, said that if the people of Scotland and Ireland could all be removed into England, the three nations would all become richer.[54]

Few pamphlets relating to the poor laws are more interesting today than the anonymous *Letter to a Member of Parliament,* published in Dublin as a pamphlet in 1723. In executing these laws, says the pamphleteer, in language which awakens echoes in our own age, the justices should find work for the honest and industrious. He therefore suggests that the deserving among the unemployed be put to work improving grounds, keeping open the course of rivers, draining fens, discovering mines, and increasing manufacture.[55] He makes an additional suggestion which looks

[53] "Of all the many proposals made for the employment of the Poor, the idea of running them for a profit is one of the most interesting. It marks most definitely the fact that the Poor from being fellow-countrymen had become a distinctive species, a sect apart. That the Poor, because they were poor, should be collected in colleges or cities, the sole qualification for which was unemployment and poverty, casts an illuminating light on the mentality of the early eighteenth century." *Ibid.,* 46.

[54] Petty, *Economic Writings,* Hull edition, I, 285 ff.; II, 563 ff. Despite his attempt to be jocular about his suggestion, one feels that Petty thought well of it. He writes: "And here I beg leave . . . to interpose a jocular, and perhaps ridiculous digression, and which I indeed desire Men to look upon, rather as a Dream or Revery, than a rational Proposition; the which is, that if all the *moveables* and People of *Ireland,* and of the Highlands of *Scotland,* were transported into the rest of *Great Brittain;* that then the King and his Subjects, would thereby become more *Rich* and *Strong,* both *offensively* and *defensively,* than now they are." *Ibid.,* I, 285. The emphasis is, of course, upon the good of the state, not the individual.

[55] "For I take much more pleasure in being their Advocate than their Accuser. They shall pave your Streets, drain your Bogs, make your Rivers Navigable, mend your Roads, build your Bridges, adorn your Churches, watch you while you Sleep, fight your Battles, and carry you on their Backs." But, the writer adds, when they have done this, "let them not go Naked themselves; when they have ploughed our Land, let them not be like the muzzled Ox that may not taste the Corn, and when they have lost their Limbs, or shed their Blood in Defence of our Country, let us not leave their Widows and Children uncared for to die in ditches." *A Letter To a Member of Parliament, Concerning the Imploying and Providing for the Poor* (Dublin, 1723) [Seligman Collection], 14–5.

forward toward the day of labor unions and various types of benevolent and mutual aid societies for laborers. I am wondering, he says, if in great industrial towns where there are more poor than can be provided for by ordinary means, laborers "may not be cast into such Companies, and subjected to such Rules, as may make them maintain their own Poor." These proposals will strike liberals today as intelligent and good. At the same time, it must be remembered that to a man with Swift's deep suspicion of "projects" of all sorts, they must have appeared highly chimerical. Moreover, the fact that later in life Swift himself was active in the administration of institutions of charity and actually worked out a system by which he made small loans to needy laborers, does not preclude the notion that Swift was capable of satirizing such a scheme, for Swift was a complex character, capable of remarkable inconsistencies, as illustrated by the circumstance that he often villified the very people whom he did so much to defend against injustice and oppression. It is therefore appropriate that we consider other schemes similar to the Dublin proposal of 1723.

A somewhat similar plan was suggested by Sir William Fownes in 1725.[56] Sir William is concerned with the problems of idle children. Vividly he describes the contemporary scene: "strolling Women loaden with Children . . . most of which have either Husbands, or Fellows . . . sculking, idle, drunken. . . ." Meanwhile youth of both sexes loaf, sculking about gentlemen's stables and houses, "running often on pimping Errands from Taverns."[57]

In 1729, the year when the *Modest Proposal* was being written, David Bindon, Irish economist, proposed a scheme for supplying the poor with money at a low rate of interest. Since the common people have nothing of value to pawn, Bindon points out, they are forced to borrow at usurious interest.[58] Every city in Ireland

[56] Sir William Fownes, *Methods Proposed for Regulating the Poor* (Dublin, 1725) [Seligman Collection].

[57] *Ibid.*, 9. Fownes' description of migratory labor in eighteenth century Ireland reminds one of John Steinbeck. Complaints have been made, he writes, of trouble caused by "marching Gangs of Women, Children and youth" who leave their cabins, gardens, cows, or goats for months "whilst they follow the Harvest-Labourers." *Ibid.*, 16.

[58] David Bindon, *A Scheme For Supplying Industrious Men with Money to carry on their Trades, and for better Providing for the Poor of Ireland,* 2nd edition (Dublin, 1729), 19.

should erect a "Lombard." Dublin, for example, could erect one with a fund of ten thousand pounds, to be lent on security of household goods, jewelry, and other chattel. These loans could be used to set poor people up in business.[59]

I am, of course, suggesting that the *Modest Proposal* is, among other things, a burlesque on projects concerning the poor. Does the suggestion that the proposals just mentioned must be considered as background for Swift's tract seem somewhat far-fetched? If so, consider a rather special group of such proposals. Observe that most of the authors of these proposals (unlike Swift) regard as axiomatic the proposition that people are the riches of a nation; and, more important still, *observe the titles.* This group includes: *An Essay or Modest Proposal, of a Way to encrease the Number of People, and consequently the Strength of this Kingdom,*[60] probably written in 1693; the *Modest Proposal for the More Certain and yet more Easie Provision for the Poor,*[61] written in 1696, in which a remedy for base money is sought and workhouses advocated; and a broadside entitled the *Humble Proposal of G. M. for Making England Flourishing & Happy,*[62] which deals with poor rates and education for the children of the poor.

Several significant facts emerge from a brief consideration of these tracts on population and poverty. First, Swift's *Modest*

[59] *Ibid.*, 12–13. It is to be noted that the tract contains a considerable amount of statistical material.

[60] Kress Collection.

[61] The full title is: *A Modest Proposal For the More Certain and yet more Easie Provision for the Poor. And Likewise for the better Suppression of Thieves, Diminishers And Corruptors of the Coyn, and other Lewd Livers. Tending much to the Advancement of Trade, Especially in the most Profitable part of it. The Manufactures of the Kingdom* (London, 1695/6) (Seligman Collection). It advocates the establishment of two public houses in every county of England or "division of London," each unit to consist of two or three thousand families; and the provision that one house should be used as a hospital and workhouse, the other as a workhouse and prison. The writer anticipates the objection that the plan will be a needless burden on the public, "in loading it with the Charge of so many children." The answer to this objection is predicated on the assumption that people are the riches of a nation. "I think it is a fault not to encourage the increase of Lawful Children, especially when they are likely to be train'd up in all Frugality and Industry." *Ibid.*, 12. This training, he adds, will cause little or no expense, and yet will be "a mighty Advantage to the Public." *Ibid.*, 12.

[62] [Kress Collection], 17.

Proposal was offered to a public accustomed to the sight of "humble petitions" and "modest proposals," displayed on the book-stalls of London, Edinburgh, and Dublin, dealing with economic problems, particularly with problems concerning population, labor, unemployment, and poverty.[63] Second, the tracts on population ordinarily hewed to the doctrinal line drawn by the advocates of increased numbers. Third, these tracts were characterized, more often than not, by emphasis on the economic good of the Leviathan-state and disregard for the individual. Fourth, and most important, it seems clear that Swift's *Modest Proposal For preventing the Children of POOR People From being a Burthen to Their Parents or Country, and For making them Beneficial to the Publick* was not merely a characteristic Swiftian bit of phraseology: it was obviously a burlesque on the titles of certain types of economic tracts.

Since Swift's title is so clearly charged with economic implications, we shall not be surprised to find, upon analysis, that the tract itself touches on contemporary economic problems in virtually every line. In it Swift discussed economic statism, the Navigation Acts, the mercantilist concept of the balance of trade, the maxim that people constitute the riches of the state, the rival theory that there is a danger of overpopulation, the Swiftian proposition that general economic laws do not necessarily apply to Ireland, the poor rates, projects concerning population, "political arithmetic," the tendency to regard children as commodities, and the impotent poor, particularly bastard children. The spotlight is thrown on the last four items.

It is possible to consider separately the various strands which were woven into the tapestry of the *Modest Proposal* and to follow, in a general way, the hand of the weaver as he deftly worked at the masterpiece.

[63] Other "humble petitions" and "modest proposals" include Thomas Thwaites' *A Proposal humbly dedicated to the King, Lords, & Commons of Great Britain; setting forth the manner how we may very profitably employ our now idle, changeable, young, weak, feeble, and aged poor* (London, 1725); and the *Proposal for maintaining of the poor, and discouraging of vagabonds, and vagrant and sturdy beggers* (Edinburgh, 1726). Observe, however, that "humble petitions" and "modest proposals" sometimes dealt with economic problems of other types. For example, *An Humble Proposal To the People of England, For the Encrease of their Trade* (London, 1729), ascribed to Defoe, contained a plea for the protection of the wool industry.

Consider first the general problem of population. In the fourth book of *Gulliver* Swift had revealed a passing interest in this problem. The wise horses were described as being anxious to avoid an increase in population. Each couple tried to limit its offspring to two. "This caution is necessary," Gulliver remarked, "to prevent the country from being overburthened with numbers."[64] Thus Swift enunciated his opposition to the prevailing tendency to call for increase in numbers; but he revealed, at this time, no passionate convictions on the subject. Beginning, however, in 1728, perhaps a few months before he began the *Modest Proposal,* he suddenly became intensely concerned with theories about population and related problems. *In An Answer to a Paper Called "A Memorial"* he declared that Ireland had more people than she needed under prevailing conditions; that it would be well if many emigrated, since "where the plough has no work, one family can do the business of fifty." It is error, he continued, to assume that people are the riches of a nation.[65] On May 17, 1729, he wrote to Chetwode about "the universal complaints and despair of all people."[66] Ball says that at about this time Swift was occupied by consideration of Irish poverty to the exclusion of almost every other subject.[67] In August Swift wrote Pope about the miseries of Ireland, saying that he had a mind, for once, to let him know the state of affairs there, "and my reason for being more moved than perhaps becomes a clergyman."[68] During 1729, too, Swift and Sheridan were discussing Irish conditions, including population and unemployment, in *The Intelligencer.* Hardly a tract written by Swift in 1729—and it was a year of tracts—failed to deal with these same subjects.

Swift's new concern with economic theory was a result, in part, of the pamphlet warfare between Swift and John Browne, and this exchange induced Swift to study contemporary economic doctrines closely for the first time and to declare general economic laws suspect. *Maxims Controlled for Ireland,* his most ambitious formulation of this point of view, was probably written a few months before

[64] Case edition, 291.
[65] Swift, *Works,* Temple Scott edition, VII, 114.
[66] Swift, *Correspondence,* Ball edition, IV, 81.
[67] *Ibid.,* IV, 81.
[68] *Ibid.,* IV, 88–9.

the *Modest Proposal* and contains, in one paragraph, the germ of several ideas which he was to develop in his famous satirical pamphlet. In this paragraph he considers one of the maxims of contemporary writers which he singles out as being particularly inapplicable to Ireland: the proposition that people constitute the riches of a nation. Swift points out that Ireland actually has many more people than she can support, since there isn't enough trade to supply anything like adequate employment; and that, as a consequence, only one child out of six is employed, the other five lying "a dead weight upon us, while half the population support themselves by begging and thievery." He then flies in the teeth of received opinion by suggesting that emigration would really be a boon. Then, as though adding an afterthought, and with a characteristic Swiftian twist, he makes the grim suggestion that since the poor suffer so much, he is really pleased when he hears of deaths among them.[69] Swift writes:

> I confess myself to be touched with a very sensible pleasure, when I hear of a mortality in any country parish or village, where the wretches are forced to pay for a filthy cabin, and two ridges of potatoes, treble the worth; brought up to steal or beg, for want of work; to whom death would be the best thing to be wished for on account both of themselves and the public.[70]

How did this grim, hyperbolical observation, the sort of remark thrown off so easily by Swift, become the barb with which the master of irony tipped his most lethal shaft? How did the grim remark become the macabre "project"? George Brandes has remarked that a creative artist does not choose a certain subject but that "a nerve in him is touched, vibrates, and reacts."[71] What caused the vibration which led the artist Swift, toying with thoughts of the advantages of death to the poor of Ireland, to fasten on the notion of proposing that Irish children should be cooked and eaten? In a study dedicated to the proposition that too much attention has been paid to so-called "literary" sources,

[69] Leslie Stephen points out that in *Maxims Controlled* Swift remarks on the lamentable contradiction presented in Ireland to the maxim that the "people are the riches of a nation" and that the *Modest Proposal* is "the fullest comment on this melancholy reflection." *Swift* (London, 1903), 165.

[70] Swift, *Works*, Temple Scott edition, VII, 71.

[71] George Brandes, *William Shakespeare* (New York, 1927), 433.

too little to contemporary tracts,[72] I find myself, in this instance at least, resorting to a "literary" source. During the year 1729 Swift and Thomas Sheridan, his boon companion and loved confidant, were editing jointly a weekly periodical called *The Intelligencer*. The seventeenth number, written by Sheridan, dealt with the poverty of Ireland. The great intimacy between Swift and Sheridan and the circumstance that they did all of the work on the journal themselves[73] leave little doubt that Swift was familiar with an arresting passage in Number Seventeen, in which Sheridan suggests ironically, as writers like Browne had suggested seriously, that Ireland is really wealthy. As a final argument, Sheridan refers to the large number of beggars, since "it is a common Observation that Riches are the Parent of Idleness, Sloth, and Luxury," which, in turn, produce beggary.[74] Then, to give his argument a final punch, he tells the story, related, he says, by the Elizabethan chronicler, Fynes Moryson, in his account of Tyrone's Rebellion, of the widow of Newry who, having six small children and no food, shut the doors of her home and died from despair, after which her children were found eating her flesh.[75] Then Sheridan passes on to an account of the punishment meted out by Sir Arthur Chichester, then Governor of the North of Ireland, to *twelve women who made a practice of stealing children, whom they eat.* The passages from Moryson, which occur in an account of Tyrone's

[72] It would be possible to account for the "vibration" by resorting here, as I have in general elsewhere, to contemporary economic writings. In the second part of Arthur Dobbs' *An Essay On the Trade and Improvement of Ireland* (Dublin, 1861), 443, the writer, referring to the treatment of children by the poor, wrote: "They exercise the greatest barbarities upon children, either their own or those they pick up, by blinding them or breaking and disjointing their limbs when they are young to make them objects of compassion." But while Swift *might* have read this statement by Dobbs, which appeared in 1729, he was almost certainly familiar with the "literary" source to which I refer.

[73] Swift wrote to Pope on June 12, 1732: "Two or three of us had a fancy, three years ago, to write a weekly paper and call it an Intelligencer . . .; the whole volume . . . *was the work only of two, myself and Dr. Sheridan.* If we could have got some ingenious young man to have been the manager, who should have published all that might be sent to him, it might have continued longer, for there were hints enough. But the printer here could not afford such a young man one farthing for his trouble, the sale being so small, and the price one half-penny." [Emphasis supplied.] Swift, *Correspondence,* IV, 307.

[74] *The Intelligencer,* Reprinted in London (1729), 191.

[75] *Ibid.,* 195.

Rebellion, are sufficiently striking in the present context to warrant quotation:

> Sir Arthur Chichester, Sir Richard Moryson, and the other Commanders of the Forces sent against *Brian mac Art* aforesaid, . . . saw a most horrible Spectacle of three Children (whereof the eldest was not above ten Years old,) all eating and gnawing with their Teeth the Entrails of their dead Mother, upon whose Flesh they had fed 20 Days past, and having eaten all from the Feet upward to the bare Bones, roasting it continually by a slow Fire, were now come to the eating of her said Entrails in like sort roasted, yet not divided from the Body, being as yet Raw.[76]

The famine was so great, continues this Elizabethan Daumier, that:

> the common Sort of the Rebels were driven to unspeakable Extremities (beyond the Record of most Histories that ever I did read in that kind). . . . Capt. Trevor and many honest Gentlemen lying in the Newry can witness, that some old Women of those Parts, used to make a Fire in the Fields, and divers little Children driving out the Cattle in the cold Mornings, and coming thither to warm them, were by them surprized, killed, and eaten, which at last was discovered by a great Girl breaking from them by Strength of her Body.[77]

Some soldiers, Moryson says, "found the Children's Skulls and Bones, and apprehended the old women."[78]

Although I find no direct, testimonial proof that Swift read either Moryson or the reference in *The Intelligencer* to Moryson, nevertheless the probability that he read Number Seventeen and that he either turned to Moryson or discussed the relevant passage with Sheridan, and that he did so about the time he was writing the *Modest Proposal,* is overwhelming. If we are willing to believe that Sheridan and Swift, linked by the closest ties of friendship and editorial association, both hit, *about the same time*—and independently—upon the notion of emphasizing the plight of Ireland by using startling material dealing with the eating of children, then we must recognize here the existence of one of the most remarkable coincidences in the history of literature. It seems reasonably safe to assert that Swift got the basic idea of *A Modest Proposal* from Fynes Moryson.

[76] Fynes Moryson, *History of Ireland* (Dublin, 1735), II, 282–3.
[77] *Ibid.*, II, 283.
[78] *Ibid.*, II, 283.

But Swift needed a literary frame. This he found in contemporary tracts dealing with economic projects, particularly those concerned with population and unemployment. Swift's opposition to this commercial rash, springing from his early hatred for traders and from his contempt for visionary schemes, we have already examined. In truth, the entire chapter on "projects" may be regarded as background for this aspect of the *Modest Proposal.* More than one tract written in 1729 proclaimed his rising impatience with "speculative people," "schemes," and "abortive projects." In the *Answer to Several Letters From Unknown Persons* he asserts that "there is hardly a scheme proposed" for improving Irish trade which does not show stupidity and ignorance.[79] In the *Letter Concerning the Weavers* he says: "I am weary of so many abortive projects for the advancement of trade, of so many crude proposals in letters sent me . . . of so many contradictory speculations."[80] In *A Letter to The Archbishop of Dublin Concerning the Weavers* he asserts that although "speculative people" may "busy their brains as much as they please," the only way to save Ireland is to renounce luxury.[81]

Many signs indicate that Swift deliberately and consciously employed as his prototype the contemporary tract plugging a favorite "project" and, at the same time, wrote a burlesque on the breed of projectors,[82] much as Pope used the epic scheme as a device for satirizing contemporary society even as he wrote a burlesque on the epic. The very title of Swift's tract, as I have already indicated, was lifted from similar language in titles of tracts advancing "projects" for the solution of problems of popu-

[79] Swift, *Works,* Temple Scott edition, VII, 123–4. Swift continues, in the same sentence: ". . . I laught with contempt at those weak wise heads, who proceed upon general maxims, or advise us to follow the example of Holland and England. These empirics talk by rote, without understanding the constitution of the kingdom."

[80] *Ibid.,* VII, 138.

[81] *Ibid.,* VII, 136. Temple Scott's note is relevant. He writes: "In this letter, so characteristic of Swift's attitude towards the condition of Ireland, he aims at *a practical and immediate relief.* The causes for this condition discussed so ably by Molesworth, Prior and Dobbs in their various treatises are *too academic* for him. His 'Proposal for the Universal Use of Irish Manufacture' well illustrates the kind of practical reform Swift insisted on." [The emphasis is supplied.]

[82] Mason, *op. cit.,* 375, wrote: "The cold, phlegmatic style of a political projector, who waves the consideration of all the finer feelings of humanity, or makes them subservient, as matters of slight moment, to the general advantages proposed in his plan of financial improvement, is admirably well satirized."

lation. Somewhere in his biography, Boswell said to Johnson: "So, sir, you laugh at schemes of political improvement?" To this Johnson replied: "Why, sir, most schemes of political improvement are very laughable things." Something of the same spirit entered into *A Modest Proposal.*

Swift's technique in the *Modest Proposal,* like his choice of a title and of a model, can be traced to the influence of contemporary economic literature. It is the technique of the political arithmetician and, since the use of this technique contributes most to the special flavor of the tract, it should be carefully examined. In this connection, I turn to the stimulating but misleading comments by Edmund Wilson on Swift's statistical style. He is comparing Swift's use of figures with Marx's. Karl Marx, he says, is the greatest ironist since Swift: the logic of the "modest proposal" can be compared with Marx's defense of crime in which he argues that crime takes care of the superfluous population. Moreover, Wilson says, Marx shares with Swift the ability "to get a certain poetry out of money." He finds in Swift "*a kind of intellectual appetite for computations and accounts and a feeling sensuous for currency.*" In *The Drapier's Letters,* for example, "we seem to see the coins, hear them, finger them." Swift describes "the base discs, with their flat little ring, by which the English are trying to perform the sleight-of-hand trick of cheating the Irish." Alas, however, comments Mr. Wilson, "with Marx the idea of money leads to something more philosophic."[83] No one has sensed more keenly or described more vividly the importance of the statistical element in Swift's prose.[84] Yet we must not permit Wilson's

[83] Edmund Wilson, "Karl Marx: Poet of Commodities," *New Republic,* CII 46–7.

[84] One of the best comments along this line comes from the introductory note to the *Modest Proposal* in *Eighteenth Century Prose,* edited by L. J. Bredvold, H. K. Root, and George Sherburn (New York, 1935), 159. The authors speak of a "period when essays on trade or on 'political arithmetic' were beginning the modern science of political economy. With a somewhat ominous simile Swift seems to be saying, 'You love to figure populations, needs, and productivity with dispassionate science as if men and women were nothing but so many cattle . . . and yet you call me a misanthrope. Perhaps you are right: the proper way to consider these wretches who are reduced to the state of brutes may be as mere animals. But let me show you what you sound like!' His modest proposer putters about with his estimates and figures, while between the lines Swift reads us a tremendous lesson on the necessity of Christian charity as a supplement to 'political arithmetic.'"

brilliant critical virtuosity to give us the wrong slant on Swift's attitude toward "computations." In *A Modest Proposal,* for instance, he is no more enamoured of statistics than he is enamoured of the idea of eating baked Irish babies. Swift writes about "computations" not in the spirit of poetry but with a sense of irony. He had presumably read Graunt, Petty, Childs, Davenant, and Browne.[85] His scorn for their statistics was natural, like his scorn for projects. The same impulses which led to the satire on science in *Gulliver,* resulted in a hearty dislike for one of science's youngest offspring, the infant school of political arithmeticians. In the second book of *Gulliver's Travels,* written before he had set pen to paper on either the *Drapier* or the *Modest Proposal,* Swift describes the King of the Brobdingnagians, here apparently the voice of Swift, as laughing at Gulliver's "odd kind of arithmetic (as he was pleased to call it) in reckoning the numbers of our people by a computation drawn from the several sects among us in religion and politics."[86] A little later Swift puts into the Drapier's mouth these words:

> The highest Points of Interest and Liberty have been often sacrificed to the Avarice and Ambition of particular Persons, Upon the very Principles and *Arithmetick* that I have supposed.[87]

It is natural that Swift's interest in Political Arithmetic, hitherto slight and spasmodic, should become intensified about 1729 when he suddenly became greatly concerned with economic theory. The controversy with John Browne did much to bring about such an intensification because Browne hurled at Swift a mass of computations designed to convince him that economic conditions in Ireland were improving. In *An Appeal to the Reverend Dean Swift,* after reminding Swift that people were the riches of a nation, Browne expressed surprise that Swift should "disguise our Number of Inhabitants" and offered him data concerning Irish population. The following characteristic excerpt from this tract is the sort of thing which probably led not only to the attack in *Maxims Controlled for Ireland* against the proposition that people are the

[85] See Harold Williams, *Dean Swift's Library, passim,* on Graunt, Childs, Davenant; *Works,* Temple Scott edition, IX, 280–81, on Petty.

[86] Case edition, 133.

[87] *Drapier's Letters,* David edition, 147.

riches of a nation, but also to a heightened contempt for the embryonic science of statistics. Browne supports his argument about improvement in the condition of Ireland by pointing out that there are 374,286 homes paying quit-rent, besides colleges and hospitals, which, he says:

> at an Allowance of six Souls to a House, may be equivalent in this Calculation to 42,381 Houses, and that makes the Number of Houses in all 416,667; to which if we allow a Medium of 6 Souls to the House, our Inhabitants must be about 2,500,000; and considering the prolifick Constitutions of our Country Folk, you will agree with me that six to a House is not an extravagant Allowance.[88]

Now set beside a typical statistical passage from Petty an equally characteristic burlesque of political arithmetic from *A Modest Proposal.* The passage by Petty is taken from a chapter in *The Political Anatomy of Ireland* entitled, mark you, "Of the Value of the People." Petty writes:

> Now if the annual proceed of the stock,[89] or wealth of the nation, yields but 15 millions, and the expense be 40, then the labour of the people must furnish the other 25, which may be done, if but half of them, viz. 3 millions, earned but 8 £.6s.8d. *per ann.,* which is done at 7d. *per diem,* abating the 52 Sundays, and half as many other days for accidents.[90]

Now listen to *A Modest Proposal:*

> The number of souls in this kingdom being usually reckoned one million and a half, of these I calculate there may be about two hundred thousand couples whose wives are breeders, from which number I subtract thirty thousand couples, who are able to maintain their own children, . . . here will remain an hundred and seventy thousand breeders. I again subtract fifty thousand for those women who miscarry or whose children die by accident, or disease within the year. There only remain an hundred and twenty thousand children of poor parents annually born: The question therefore is, how this number shall be reared, and provided for.[91]

[88] Sir John Browne, "An Appeal to the Rev. Dean Swift," from *A Collection of Tracts Concerning the Present State of Ireland* (London, 1729), 131.

[89] Swift reveals in *A Modest Proposal* and elsewhere familiarity with the jargon employed by the early economists in speaking of "the stock" or the "wealth" of a nation.

[90] Petty, *Economic Writings,* Hull edition, I, 132.

[91] Swift, *Works,* Temple Scott edition, VII, 208–9.

Two points should be made about this passage from *A Modest Proposal.* In the first place, it springs from a spirit of bitter mockery, not from the delight in calculations for their own sake which Mr. Edmund Wilson feels that Swift so often displays. Moreover, in satirizing the statistical approach to human problems, Swift has concentrated his fire here, as at many other points in the *Modest Proposal,* on figures dealing with human breeding.[92] Obviously certain features of political arithmetic offered better material for artistic treatment than others. No feature was more vulnerable to ironic attack than statistical references to breeders. Consider two such references. John Graunt, whose works were represented on Swift's shelves, in explaining why christenings exceeded burials in the country, but not in London, asserted that "if there be sixty breeders in London, there are more than sixty in the country."[93] Arthur Dobbs, an Irish economist, discussing methods of computing the population of Ireland, and writing in the year 1728, said:

> Thus, for instance, suppose a million of inhabitants in Ireland in 1691, when the war ended . . . ; we may reasonably suppose 500,000 of these females, the war having destroyed fewer of these than of the other sex; 240,000 of these above 14 and under 46, of an age capable to bear children. Suppose 40,000 of these barren, there would then have been 200,000 breeding women in the kingdom, each of these might have a child once in two years, so the births each year might be 100,000;. . . . By this computation the nation might double in sixteen years. . . .[94]

In his satirical statistical discussions of human breeding Swift delivers some of his most devastating strokes against contemporary attitudes toward labor and poverty. True, he says, a child "just dropped from its dam" may be supported by its mother's milk, plus a bit of additional food not costing over two shillings, for a year."[95] Again, he asserts: "I calculate there may be about

[92] Bredvold, Root, and Sherburn, *op. cit.,* 160, say: "Note how throughout the essay Swift, in order to hold a mirror up to the brutal attitude of men towards fellow men in distress, speaks of human offspring in terms of so many cattle."

[93] John Graunt, *Natural and Political Observations Upon the Bills of Mortality* (Oxford, 1665), 61–2.

[94] Arthur Dobbs, *"An Essay on the Trade and Improvement of Ireland,"* in *A Collection of Tracts and Treatises . . . of Ireland* (Dublin, 1861), II, 414–15.

[95] Swift, *Works,* Temple Scott edition, VII, 208.

two hundred thousand couples whose wives are breeders.'"[96] Moreover, he proposes that "of the hundred and twenty thousand children, already computed, twenty thousand may be reserved for breed."[97] Indeed, references to breeders and to Swift's grim proposal for solving the problem of excessive breeding constitute the chief *leit-motif* of the *Modest Proposal* and supply the suggestion for the ultimate irony of the concluding sentence of the tract in which Swift declares that he has no personal interest in the proposal.[98] "I have," he protests, "no children by which I can propose to get a single penny; the youngest being nine years old, and my wife past child-bearing."[99] The theme of human breeders is thus pursued throughout the *Modest Proposal,* even to the last lancing stroke.

Another point should be made about the influence of political arithmetic on the *Modest Proposal.* The early statisticians supplied Swift with a technique superbly adapted to his genius. I have in mind not only Swift's tendency to build up a mass of detail and overwhelm the reader with its cumulative effect, but also, and more particularly, his habitual use of what has been called "the surprise attack." Mr. F. R. Leavis,[100] in a most perceptive analysis of Swift's style, says that the most important thing in Swift—the "disturbing characteristic of his genius"—is his peculiar emotional intensity,[101] which exhibits itself constantly "in negation and rejection." Indeed, Swift's is the "most remarkable expression of negative feeling and attitudes that literature can offer." He

[96] *Ibid.,* VII, 208.

[97] *Ibid.,* VII, 209.

[98] There are, as this last instance indicates, other references to the "breeder" motif besides those in which he satirizes political arithmetic. He pretends, for instance, to be troubled by the suggestion of an American friend that the flesh of young maidens is preferable to that of boys, his anxiety arising from the realization that girls "soon would become breeders themselves." *Ibid.,* VII, 211. One of the advantages of the proposal, he argues, would be the reduction in the number of the Papists who are "the principal breeders of the nation." *Ibid.,* VII, 213. Another advantage would ensue from the circumstance that "the constant breeders" would be rid of the necessity for supporting their children. *Ibid.,* VII, 213.

[99] *Ibid.,* VII, 216.

[100] F. R. Leavis, "The Irony of Swift," *Scrutiny,* II (1934), 364–79.

[101] Mr. W. B. C. Watkins has developed this same theme, comparing Swift's passion with that of the Elizabethan dramatists, in an essay which ranks among the most illuminating of all comments on Swift. "Absent Thee from Felicity," in *Perilous Balance* (Princeton, 1939).

aims "to defeat habit," using the technique of surprise. This element of surprise results from the "dispassionate delivery of his intensities," from the "dissociation of emotional intensity from its usual accompaniments." In *A Modest Proposal,* Leavis suggests, "the matter-of-fact tone induces a feeling . . . of assent, while the burden . . . compels feelings appropriate to rejection." The contrast generates a tension—"a remarkable disturbing energy." Swift's prose creates the same effect of surprise and the accompanying atmosphere of tension which the metaphysical poets are so successful in attaining.

Leaning heavily on Mr. Leavis' interpretation and applying it particularly to one aspect of Swift's prose style, I should like to amplify my earlier remark that political arithmetic supplied Swift with a technique peculiarly appropriate to his genius. In the following characteristic passage, note how the matter-of-fact tone "induces a feeling of assent," while "the burden" generates "feelings appropriate to rejection":

> Of the hundred and twenty thousand children, already computed, twenty thousand may be reserved for breed, whereof only one fourth part to be males, which is more than we allow to sheep, black-cattle, or swine.[102]

Again, Swift writes:

> I have already computed the charge of nursing a beggar's child . . . to be about two shillings *per annum,* rags included, and I believe no gentleman would repine to give ten shillings for the carcass of a good fat child.[103]

At another point Swift writes of "a round million of creatures *in human figure,*" whose substance, pooled, "would leave them in debt two millions of pounds sterling." The phrase which I have emphasized (which strikes me as one of the most telling in the *Modest Proposal*) is obviously soaked in the spirit of political arithmetic.

Especially helpful in an analysis of the influence of political arithmetic on the style of the tract is Mr. Leavis' stimulating suggestion that Swift's technique bears a resemblance to that of the metaphysical poets. It was Dr. Johnson, I believe, who spoke of the metaphysical poets as "pursuing a thought to its last ramification." Observe how Swift pursues his modest proposal to its last statistical ramification. He coolly observes that a child will make

[102] Swift, *Works,* Temple Scott edition, 209.
[103] *Ibid.,* VII, 210.

two dishes at an entertainment for friends; that when the family dines alone, the fore or hind quarter will suffice; that, seasoned with a little pepper or salt, such a dish will be "very good boiled on the fourth day, *especially in winter*"; that he has reckoned "a child just born will weigh 12 pounds, and in a solar year if tolerably nursed increaseth to 28 pounds"—on the average.[104] A little further in the tract, continuing to play with his macabre conceit, and returning to his burlesque of the application of the statistical method to human problems, he dispassionately calculates that if one thousand families in Dublin would be "constant customers" for the flesh of babies, "besides others who might have it at merry-meetings, particularly weddings and christenings," the city would consume annually about twenty thousand carcasses, and the rest of Ireland—"where probably they will be sold somewhat cheaper" —the remaining eighty thousand.[105]

Political arithmetic, in short, supplied Swift with a subject for satire and, at the same time, with a technique which was highly appropriate to his method of writing. Professor Child remarks somewhere that Robin Hood is the creation of the ballad-muse. Similarly, may it not be said that *A Modest Proposal* is, in part, at least, the creation of whatever muse presides over the spirit of political arithmetic?

We have considered the *Modest Proposal* as burlesque project and as burlesque political arithmetic. It is, in the third place, an attack on the general tendency of the age to regard people as commodities. Indeed, this attitude is implicit in the attack on projects and statistics. It becomes explicit when Swift tells of the assurance given him by the merchants that a child under twelve "is no saleable commodity" and that even when they reach this age, they will not yield more than three pounds and a half-crown at most—not enough to defray their expenses, since "nutriment and rags" cost at least four times as much.[106] Again, consider this paragraph:

> Infants' flesh will be in season throughout the year, but more plentiful in March, and a little before and after, for we are told by a grave author, an eminent French physician, that fish being a prolific diet, there are more

[104] *Ibid.*, VII, 210.
[105] *Ibid.*, VII, 214.
[106] *Ibid.*, VII, 209.

children born in Roman Catholic countries about nine months after Lent, than at any other season; therefore reckoning a year after Lent, the markets will be more glutted than usual, because the number of Popish infants, is at least three to one in this kingdom, and therefore it will have one other collateral advantage by lessening the number of Papists among us.[107]

The discussion of this third facet of Swift's attack on contemporary economic tendencies is an appropriate place in which to consider evidence that Swift, as he wrote the *Modest Proposal,* was turning over in his mind the theories of the political economists. Take the fundamental postulate of the mercantilists that the good of the individual must be subordinated to the economic welfare of the state. Awareness of this assumption is revealed by the ironic title. The proposal is designed "For preventing the Children of Poor People From being a Burthen to Their Parents or Country, *And For making them Beneficial to the Publick.*" Again, he suggests ironically that an argument could be made against eating the flesh of girls, since "it would, I think with humble submission, *be a loss to the public,* because they would soon become breeders themselves."[108] Thus Swift on economic statism.

Consider a second point. Nothing is more characteristic of the economic doctrines of the day than reiteration of the fundamental bullionist concept of "the balance of trade." When mercantilists mention "the balance of trade," we can almost see their eyes gleam with a deep, religious light. Turn to our tract. Swift is considering the advantages of his proposal. He estimates that whereas the maintenance of a hundred thousand children two years old and over would cost at least ten shillings apiece annually, under his scheme "the nation's stock" will be augmented fifty thousand pounds a year, "and the money will circulate among ourselves, the goods being entirely of our own growth and manufacture."[109]

Closely related to the concept of the balance of trade were the Navigation Acts. These statutes may be described as mercantilism in action. Swift had repeatedly attacked these laws before he wrote the *Modest Proposal.* In this tract, he continues the onslaught. Can one doubt that he had this legislation in mind when he argues that his proposal cannot possibly offend the English

[107] *Ibid.,* VII, 210.
[108] *Ibid.,* VII, 211.
[109] *Ibid.,* VII, 213.

since "this kind of commodity"—the flesh of infants—"will not bear exportation, the flesh being of too tender a consistency to admit a long continuation in salt," although, he adds, "*perhaps I could name a country, which would be glad to eat up our whole nation without it.*"[110] Here the emphasis is Swift's, and here the Irish hatred of the Navigation Acts reaches supreme bitterness.

Finally, the *Modest Proposal* recognized and ridiculed the distinction made during the Age of Mercantilism between "the able" and "the impotent" poor. Some are concerned, Swift writes, about "that vast number of poor people, who are aged, diseased, or maimed." Swift asserts that he, however, is not worried, since they are daily dying and rotting, "by cold and famine, and filth and vermin, as fast as can be reasonably expected."[111] Swift likewise realized that the distinction between the "able" and the "impotent" poor sprang from the unwillingness of the age to spend money on charity, and from the fear of higher poor rates. My plan, he says, would cover not only children of professed beggars, but all infants of a certain age, whose parents, because of their poverty, "demand our charity."[112] Again, he says that the proposed plan would provide for children so that, "instead of being a charge upon their parents or the parish," they will contribute to the feeding of many thousands.[113]

An important corollary of the mercantilist distinction between the "able" and the "impotent" poor is the harsh attitude of the age toward beggars. Both the distinction and the harsh attitude spring from the somewhat inconsistent desire of the age to raise to a maximum the number of people employable industrially while reducing to a minimum those whose condition in life made them objects of charity and, hence, causes of increased poor rates. Most of the harsh social and economic philosophy of the day comes from those concerned with the industrial progress of the state. By contrast, the attitude of the landed Tory, especially the English landed Tory, was both liberal and humane. But the poor rates touched the pocket-nerves of these Tory proprietors. Moreover, the landed squire discovered that industrial laborers could pay rents, while beggars could not. Consequently the landlords some-

[110] *Ibid.*, VII, 216.
[111] *Ibid.*, VII, 212.
[112] *Ibid.*, VII, 207–8.
[113] *Ibid.*, VII, 208.

times joined the industrialists in denouncing beggars, whom they blamed for defaults in rents and increases in the poor rates. The landlords in Ireland were particularly inclined to be harsh in their outlook. Thus the author of *A Letter to a Member of Parliament,* writing in 1723, voicing the point of view of the landed classes, pointed out that the industrial laborers pay the king his taxes and the landlord his rent, while the beggar, on the other hand, "eats your Meal, and drinks your Milk, and pays you nothing for it. Instead, he fills you with children."[114]

A Modest Proposal opens, we should remember, with a harrowing account of these numerous beggars. In the second paragraph we learn that Swift's proposal will be aimed at making their children "sound useful members of the commonwealth."[115] Further on, the selfish landlords are cracked on the head when Swift mentions a variation on his scheme proposed by "a true lover of his country" who argued that, many gentlemen of Ireland having destroyed their deer, "the want of venison might be well supplied by the bodies of young lads and maidens."[116] Again, when Swift comes to the enumeration of the advantages of his schemes, he suggests, with obvious reference to the anxiety of the landlords about their rents, that "the poorer tenants will have something valuable of their own, which by law may be made liable to distress," thus enabling landlords to collect their rents.[117]

Thus it is evident that Swift relied upon the literature of contemporary economic controversy for title, technique, and theme. Looked at it from the point of view of the student of political economy, *A Modest Proposal* is a tract dealing with current mercantilist theories which happened to cross the threshold dividing the turbulent early Georgian world of pamphlet controversy from *belles-lettres.* Looked at from the angle of the literary critic, it is a superb work of art which happens to be saturated with economic theory.

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[114] Swift, *A Letter to a Member of Parliament, Works,* Temple Scott edition, VII, 7–8.

[115] Swift, *Works,* Temple Scott edition, VII, 207.

[116] *Ibid.,* VII, 211.

[117] *Ibid.,* VII, 213.

NOTES AND DOCUMENTS

FROM NATIONALISM TO COSMOPOLITANISM IN THE GRECO-ROMAN WORLD[1]

By Moses Hadas

We need no ancient oracle to inform us that exaggerated nationalism is a Bad Thing and that the concept of the world as a single community might be a Good Thing. The experience of another civilization in moving from nationalism to cosmopolitanism may be interesting and instructive even if, in the nature of things, it cannot provide a blue-print for us to follow. No other stretch of history offers so convenient a parallel to our own problems as does the Greek; the springs of Greek conduct were very like our own, the span of their history is manageable, with beginning, middle, and end, and they were highly sophisticated and articulate in matters of political doctrine.

Vigorous nationalism appears as early as Homer. "One omen is best," says Hector (*Iliad* 12. 243), "to fight for one's native land." The word βάρβαρος ("stuttering, unintelligible, alien") is applied in the *Iliad,* in a compound form, to the Carians (2. 867). It is not applied to the Trojans and their allies for these, unlike the Carians, were known to the poet only from the saga. Their language, customs, dress, weapons, religion are thought of as being like the Greek; in early vase paintings Trojan warriors are represented as Ionian hoplites. After the Persian War nationalist feeling retrojected the term βάρβαρος in its pejorative sense to the Trojans; the drama represented them as different and inferior, and Trojan characters were dressed in barbarian costume.

Among themselves, of course, the Greek city-states were extremely particularistic, war rather than peace being the normal relationship between them. Callinus in Ionia, Tyrtaeus in Sparta, Solon in Athens all teach local patriotism. Pindar is concerned for Boeotian reputation. The Athenian dramatists, historians, and orators who wrote during the period of Athenian-Spartan hostilities all reflect Athenian partisanship in greater or less degree. But as opposed to the barbarians all Greeks regarded themselves as a single people. Similarly the enormous differences among various barbarian peoples were overlooked; their divergence from the Greeks was the paramount characteristic which imposed a unity upon them. The dichotomy between Hellene and barbarian is sharp and decisive from the very begin-

[1] The works which have been most helpful in the preparation of the first part of this paper are: Julius Jüthner, *Hellenen und Barbaren, Aus der Geschichte des Nationalbewusstseins* (Leipzig, 1923); Johannes Mewaldt, *Das Weltbürgertum in der Antike, Die Antike* 2 (1926), 177 ff.; Julius Kaerst, *Die antike Idee der Oekumene* (Berlin, 1903).

ning of Greek literature at the close of the Greek Dark Ages. From Hesiod onwards every classical Greek author reflects, with greater or less clarity, the conviction that the Hellenes are the elect and the barbarians their inferiors. The Greeks occupy the center of the world, and their usages are the norm by which lesser peoples are judged. Solemn proclamations excluded barbarians, along with criminals, from the celebration of the mysteries and from the national games. Sacred objects and sites, including the domestic hearth, were rendered unclean by contact with a barbarian.

The barbarian is strange and repulsive, uneducated, superstitious, awkward, stupid, unsocial, lawless; he is slavish and cowardly, unrestrained in passion, petulant, cruel, violent, faithless, greedy and gluttonous. In a word, the barbarian is a brutish creature; he stands in the same relation to a Hellene as an animal does to a man. The designation *βάρβαροι* was applied even to Egyptians, Babylonians, Assyrians, and Phoenicians, to whom Greek civilization owed so much. The designation is manifestly unfair, but it is not hard to see how it maintained currency. It originated in ignorance due to remoteness, and when the Greeks came to travel they were actually superior and the older civilizations retrograde. Eighth-century colonization in the West and in Southern Russia could only corroborate the traditional contempt. In the seventh century Scythian hordes overran Asia Minor and settled in Cappadocia. Unsavory Phoenician merchants and adventurers are traditional in the *Odyssey* and Herodotus. Lydians, Phrygians, and Syrians settled in Greece as metics and formed the larger part of the slave population, especially after the feeling against selling Greeks into slavery grew. These foreigners were not the best representativs of their people to begin with, and they were further corrupted by slavery. After the Persian invasion hatred increased and became traditional.

The tradition was first questioned, but only by implication, in the work of a medical man. In his *On Airs, Waters, Places* Hippocrates attributes human differences to geographic and climatic conditions; he implies, but does not state, the fundamental equality of diverse races. The implication was made explicit in the rising sophistic enlightenment. In the papyrus fragments of Antiphon's *On Truth*[2] the plain statement is made that "all men are created alike by nature in all respects, both barbarians and Greeks." The proof is that all men breathe through their mouths and nostrils; they are therefore alike in *φύσις*, and only different in *νόμος*, which is in the last analysis merely a matter of convention, dictated by the more powerful and calculated to serve their interests. Every *δίκαιον* is also *ἄδικον*: *summum ius summa iniuria*. The injustice of *νόμος* was particularly apparent during the period of the Peloponnesian war, when many small individual *πόλεις* were forced to change their *νόμος* overnight.

[2] *Oxyrhynchus Papyri XI*, no. 1364; most conveniently consulted in Diels-Kranz, *Die Fragmente der Vorsokratiker*[5] 87 (II, 346 ff., Berlin, 1935).

But Antiphon's statement of the equality of man remained merely a characteristic example of sophistic intellectual revolt, with no discernible influence upon thought generally. Atossa's dream in the *Persae* shows Aeschylus' well-bred contempt for the Persians. Sophocles' *Ajax* illustrates (in the Teucer passages) the contemporary attitude to half-breeds. Euripides favors the disinherited in many noble lines, but the general Athenian attitude seems to be reflected in such plays as the *Iphigenia in Tauris* and the *Helen*. "Dialect" jokes at the expense of foreigners are common to all comedy, but the bad Greek of the Scythian policeman in Aristophanes' *Thesmophoriazusae*, of the god Triballos in his *Birds*, and of Pseudartabas in the *Acharnians* seems a little malicious. But it is shocking to discover that Plato is equivocal on the subject of human equality and that Aristotle frankly upholds Greek superiority.

Plato readily acknowledges the influence of geography and climate in the formation of a people's character and makes a place for the influence of education.[3] Like Thucydides Plato deduces the character of the ancestors of the Greeks from that of contemporary barbarians. Plato goes beyond Hippocrates, then, in acknowledging the fundamental equality of humanity; but his theory does not prevent him from making the commonplace differentiation between Greeks and barbarians. Plato's nationalism appears most clearly in his discussions of the state. The ideal state is thought of as a Greek πόλις, with its traditional attitude towards barbarians. Strife among Greek cities is really civil war and should be avoided or carried on humanely; real war is against barbarians and should be carried on energetically. A story told of both Socrates and Plato is true probably of neither but characteristic nevertheless: the Greek is reported to have rendered thanks that he was born a man, not an animal, a man and not a woman, a Greek and not a barbarian.

If Plato's attitude is surprising, Aristotle's is shocking. At the beginning of the *Politics* he insists that slaves are such by nature, and that barbarians are naturally slaves. It is remarkable that Aristotle should embrace and justify the Greek prejudice, with no shred of logical proof. He is led into certain inconsistencies, as when he praises the constitution of Carthage: can a good state be comprised wholly of men who are slaves by nature?

Alexander's vision was broader than his teacher's; though his own ambition may have been merely to supplant the kings of Persia and become an oriental monarch, his victories did greatly accelerate the Hellenization of the Near East. "Greek" cities with characteristic theaters, libraries, games, dress, thought spread rapidly. These were the things which were supposed to set Greeks apart from other men, and now "Greeks" were to be found all over the world. Concomitantly alien cultural elements came to be appreciated. Babylonian astrology, Persian magic, Egyptian and Jewish

[3] The material is collected in F. Weber, *Platons Stellung zu den Barbaren* (Munich, 1904); cf. Jüthner, 22–28.

thought were studied; translations of Zoroaster, Mago, the Bible, were made; curiosity about foreign peoples was aroused and histories of them written, such as Berosus' work on Babylonia, Manetho's on Egypt, and Demetrius', Eupolemus', and Artapanus' on the Jews. The world was changed, the πόλις and Greece itself were transcended in a larger concept and the traditional distinction between Greek and barbarian obliterated.

The changes in the world were first recognized philosophically, it seems, by Theophrastus, Aristotle's successor as head of the Lyceum. A fragment of his[4] declares that all people are related, either because of an ultimate common ancestry, or because of their common sustenance, habits, and character. Here the implication of Hippocrates and the enlightenment of Antiphon are given scientific expression. The world had attained new dimensions, in fact as well as in theory.

And now we are prepared for the classic utterance of the Cynic Diogenes who, when he was asked of what city he came, answered, "I am a κοσμοπολίτης, a citizen of the world" (Diogenes Laertius 6. 72). But we must be careful to note that in Diogenes the statement does not bear the philosophic implications it acquired in later Stoicism, nor was Diogenes' cosmopolitanism the well-travelled man's interest in alien cultures, like that of Herodotus. It was rather a rebellious reaction against every kind of coercion imposed by the community upon the individual. The meaning is negative rather than positive; Diogenes is really saying, "I am not a citizen of any of your Greek cities."[5] The virtue which it is the function of the philosopher to teach is equally attainable by people of all classes regardless of sex or education. The morally good are all friends of one another, regardless of conventional barriers. Diogenes' cosmopolitanism, then, was the proud assertion of a ragged exile's consciousness of his own worth in the face of a bourgeois society which scorned him. But Crates of Thebes, the well-born disciple of Diogenes who renounced wealth and position and took up his master's scrip and staff and ragged cloak, gave a positive, philanthropic turn to the meaning of the word. "I am a citizen of the lands of Obscurity and Poverty, impregnable to Fortune, a fellow-citizen of Diogenes," he said (Diogenes Laertius 6. 93), but in his case it was evident that he had become naturalized in the larger community out of choice, and he preached its advantages over the smaller community out of love.

But it was the individual's happiness and not the well-being of the community, large or small, that the Cynics were interested in. It was the Stoics who thought primarily in terms of the community, insisting that nothing could be injurious to the individual if it was good for the community of which the individual was a part. The crucial point is the proper understanding of "community." Relationships of blood or race or country are

[4] Recovered by J. Bernays out of Porphyry; see his *Theophrastos' Schrift über Frömmigkeit* (Berlin, 1866), 97.

[5] See D. R. Dudley, *A History of Cynicism* (London, 1937), 34 f.

meaningless, political and social stratifications are rejected. All good men, whatever their social or geographic position may be, are equally citizens of the larger πόλις which embraces the entire cosmos: they are in fact κοσμοπολῖται, citizens of the world. The cosmos is a single organism which embraces the stars and the earth, men, animals and plants—all things which share in the animate being of the cosmos. The cosmos is the outer form of the divine animate spirit, and therefore God. Man is a favored part of the cosmos for he may possess an intelligent view of it and is therefore in a special sense a κοσμοπολίτης. Men and God are alike members of the same πόλις, which all must regard as their true fatherland. *Universus hic mundus una civitas communis deorum atque hominum existimanda est* (Cicero, *De Legibus* 23).

Zeno had sat under Crates, but unlike the Cynic's cosmopolitanism Zeno's involved expansion and assimilation rather than contraction and limitation. "Zeno's earliest work," writes Mr. Tarn,[6] "his Republic, exhibited a resplendent hope which has never quite left men since; he dreamt of a world which should no longer be separate states, but one great City under one divine law, where all were citizens and members one of another, bound together, not by human laws, but by their own willing consent, or (as he phrased it) by Love." With Zeno and his followers the doctrine of human equality and brotherhood was no mere specimen of enlightened wit, to be admired and ignored. The world was now become receptive to the notion. At a banquet at Opis Alexander had prayed for a union of hearts (ὁμόνοια) and a joint commonwealth of Macedonians and Persians (Arrian, *Anabasis* 7. 11. 9). Geographers had given up studying the world according to national boundaries but had developed the concept of the οἰκουμένη, the habitable world considered as a single unit. Nor were the Stoics the impractical perfectionists their austere doctrine would make them. Their theory recognized no degrees in virtue and assumed the equality of men; but they did in fact realize that men differ in ability, character, and circumstances; as Chrysippus put it, nothing could prevent some seats in the theater being better than others. Furthermore, the world being composed of ordinary men, ruled by people who were not philosophers and had no knowledge of the universal law, their world state was impossible of realization. But the Stoics were willing to compromise their perfectionism and to do what they could to bring their ideal nearer. They advised rulers, they wrote books on how states should be governed, they were ready to campaign actively against bad governments. Sphaerus of Borysthenes, for example, a disciple of Zeno, seems to have been a driving force behind Agis' and Cleomenes' social revolution in third century Sparta; and a century later Blossius of Cumae seems to have been responsible for much of the liberal program of the Gracchi. Notions of a just concord between states as well

[6] W. W. Tarn, *Hellenistic Civilisation* (London, 1930), 73.

as between citizens in a single state began to take shape. The germs of international law go back to third century Stoicism.

The Middle Stoa in particular was willing to relax the older ideals and accommodate itself to reality. Instead of ignoring existing states and dreaming of the ideal cosmic state teachers like Panaetius strove to introduce Stoic ideals into existing states. The first step was to place such states under the direction of a philosophical and moral élite. When Panaetius came into contact with Roman traditions and Roman power in the person of Scipio Aemilianus in the Scipionic Circle Stoicism came into position to influence a world power which was temperamentally sympathetic to it.[7] The Romans had their optimates: they needed only to become optimates in the Stoic sense; Roman world dominion needed only to take on the character of a Stoic commonwealth. Rome had succeeded magnificently in Latinizing Italy and moulding it into a unified nation, but its imperial domination, during the half century of the Punic Wars, had degenerated into organized plunder by an exploiting capitalist group which had no regard for the human or material degradation of subject peoples. The "mixed" constitution comprising all elements in the state urged in the sixth book of Polybius and in Cicero's *De Republica* is an echo of the Stoic doctrine of Posidonius current in the Scipionic circle; its goal is *civium beate et honeste vivendi societas*. The various elements in the state must not be separated by their private interests but must unite in the service of the greater commonwealth, under prudent oversight, for the freedom of individuals and for friendly relations between all individuals. The common nationality of the human race becomes the guiding rule for Roman statesmen and the basis for the cultural mission of the Roman world empire. Out of the *communis humani generis societas* (*De Officiis* 3.28) the Middle Stoa also evolved an ideal of law which should be valid for all subjects of the empire; the law of the πόλις makes way for the law of world society. Even the exercise of rule is to be based not on power but on law. The ideal of the unity of the human race gave rise to the new ethical principle of *humanitas*.

But besides the ideals of the mixed constitution and of the οἰκουμένη Stoicism was responsible for another development in Rome which is of perhaps greater significance in human history, and that is the ideal of the principate. The monarchic idea in Rome grew out of the prolonged military commands, but Greek influence was important in shaping it. In Julius Caesar himself and with the later emperors beginning with the Severi the monarchy was of the oriental Hellenistic type, based on the personal power and the divine character of the ruler. But the principate of Augustus preserved the character of a Roman magistracy and all the traditional Republican forms. Augustus' preeminence rested on the authority bestowed by his personal merits, and was not a private possession which he could transmit to his heirs.

[7] See J. Kaerst, *Scipio Aemilianus, Die Stoa, und der Prinzipat, Neue Jahrbücher für Wissenschaft und Jugendbildung* 5 (1929), 653 ff.

In the *Monumentum Ancyranum* he himself says he excelled in *auctoritas*, not *potentia*. Early Roman history exhibits numerous outstanding men, but no single genius surrounded with a nimbus of divine origin and superhuman character until Scipio Africanus,[8] who was, significantly, the first to be impregnated with Greek ideas. Polybius thinks the mystery surrounding Scipio was engineered for political reasons, but Scipio probably believed in his extraordinary gifts, in keeping with Stoic doctrine.

The idea of a single ruler endowed with special *auctoritas* who should be a *moderator* and *rector* of a commonwealth which should embrace the entire οἰκουμένη was the concept derived from Stoicism through the Scipionic circle and its followers which Augustus consciously adopted as the guiding principle of his rule and which procured a large measure of peace and happiness for mankind for a period of two centuries.[9] Stoicism had led the struggle on behalf of *moriens libertas*, a struggle embodied in the Younger Cato, who is the martyr of republican freedom. Augustus' system was set up in conscious opposition to Caesar's, upon the pattern suggested by the Stoics.

Whenever succeeding emperors tended to regard their position as a personal right rather than a ministry the Stoic opposition became vocal. That is why emperors like Domitian persecuted the "philosophers." Nerva and Trajan show their compliance with Stoic teaching by their rejection of completely hereditary rule if by nothing else. Marcus Aurelius, who conceived his royal station as a duty something like a martyrdom is the truest representative of Roman Stoicism. And because he was incomparably the most influential man in his world his full recognition of the οἰκουμένη is profoundly significant. "All fits together for me which is well-fitted for thee, O thou Universe," he cries (*To Himself* 4. 23), "from thee are all things, to thee come all things; the poet saith 'Dear City of Athens,' but wilt thou not say 'Dear City of God'?" St. Augustine had ready to his hand not only the great phrase but also the outlines of the City of God, elaborated by generations of socially-minded teachers that had gone before. The god who was a member of the city and its animate force altered his character; the outlines of the city were blurred and its parishes developed separate modes of life. But from time to time, as especially in the sixteenth century, thoughtful men looked back upon it wistfully and were inspired to undertake a partial rehabilitation. Rehabilitation is sorely needed now, and inspiration if not light and leading may be drawn from the long struggle which men of old waged to bring cosmopolitanism out of nationalism.

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[8] See R. M. Haywood, *Studies on Scipio Africanus* (Baltimore, 1933).

[9] On the basis of a careful analysis of Cicero's *De Republica* R. Reitzenstein has demonstrated that the idea of the principate is a contribution of Stoicism through Panaetius and the Scipionic Circle: *Nachrichten der Göttingener Gesellschaft der Wissensch.*, 1917. Cf. A. M. Young, *The Stoic Creed on the Origin of Kingship*, *Classical Weekly* 28(1934), 116 ff.

THE NOBLE SAVAGE OF MADAGASCAR IN 1640

By Louis B. Wright

The felicity of man in a state of nature was a popular theme for conversation in the salons and drawing rooms of the last half of the eighteenth century. Lord Monboddo tried to convince the skeptical Dr. Johnson that a savage was happier than an English shopkeeper;[1] Omai, a native of the Society Islands (brought back by Captain Furneaux in 1774), was lionized in London by people of fashion as the perfect example of nature's noblemen; and John Hawkesworth created such a romantic vision of Polynesian beauty that English tradesmen were induced to carry the gospel to Tahitians, perfect in everything except Calvinistic theology. So well-known is the story of eighteenth-century primitivism that we sometimes forget the interest of earlier sophisticates in the noble qualities of uncivilized man.[2]

A forgotten seventeenth-century exponent of the virtues of primitive society in contrast with urban cultivation was Walter Hamond, a ship's surgeon, who published in 1640 *A Paradox. Prooving, That the Inhabitants of the Isle called Madagascar, Or St. Laurence, (In Temporall things) are the happiest People in the World.*[3] The tract was brought out by Nathaniel Butter, an industrious printer of newsbooks and popular pamphlets, and was designed as propaganda for the first serious effort of the English to

[1] See Chauncey Brewster Tinker, *Nature's Simple Plan* (Princeton, 1922), *passim.*

[2] Among the many works on primitivism, the following are especially suggestive in any discussion of the beginnings of the noble savage idea: Gilbert Chinard, *L'Exoticisme américain dans la littérature française au XVI^e siècle* (Paris, 1911) and *L'Amérique et le rêve exotique dans la littérature française au XVII^e et au XVIII^e siècle* (Paris, 1913); Benjamin Bissell, *The American Indian in English Literature of the Eighteenth Century* (New Haven, 1925); George Boas, *The Happy Beast in French Thought of the Seventeenth Century* (Baltimore, 1933); Lois Whitney, *Primitivism and the Idea of Progress in English Popular Literature of the Eighteenth Century* (Baltimore, 1934); Hoxie Neale Fairchild, *The Noble Savage: A Study in Romantic Naturalism* (New York, 1928).

[3] The work was licensed to Nicholas Bourne and Nathaniel Butter by the Stationers' Company on October 29, 1639. Its subtitle further explains its purpose: "Whereunto is prefixed, a briefe and true Description of that Island: The Nature of the Climate, and condition of the Inhabitants, and their speciall affection to the English above other Nations. With most probable Arguments of a hopefull and fit Plantation of a Colony there, in respect of the fruitfulnesse of the Soyle, the benignity of the Ayre, and the relieving of our English Ships, both to and from the East-Indies."

The copy in the Huntington Library, quoted here, contains first "A Description Of Madagascar," Sigs. A 4–B 4 v., which is followed by "A Paradoxe," Sigs. D 1–F 4. The latter portion is in a different type from the first part. Whether this copy was made up from two separate editions, I have been unable to determine.

occupy the island of Madagascar. The book is of considerable significance, not merely as an early argument of the virtues of primitive society, but as a landmark in the effort to break the East India Company's monopoly of trade and development in the Indian Ocean.

Walter Hamond had been employed by the East Indian Company as a surgeon in the ship "Jonas" or "Jonah"—for it was known by both names. He had been on several voyages to India and on one occasion had spent four months on Madagascar. On the homeward voyage in 1635, the "Jonas" was commanded by Captain John Weddell, an experienced officer who a little before had had the misfortune to lose his flagship, the "Charles," by fire in Swally Roads. Receiving unjust treatment, he fancied, from the East India Company as the result of the loss of his ship, Weddell resigned and accepted the command of a fleet being fitted out for trade in the East Indies by a rival organization known as Courteen's Association after the promoter, Sir William Courteen.[4] Hamond apparently left the East India Company's employment about the time Weddell resigned. Probably he followed the commander into the employment of Courteen. At any rate, by 1639 he was writing a pamphlet clearly designed to further the schemes of rivals of the East India Company. Incidentally, Courteen's Association had a ship named the "Paradox," but whether the name was inspired by the title of Hamond's tract, it is impossible to say.

The colonization of Madagascar was advocated in 1637 by Endymion Porter, a courtier, who persuaded King Charles that the endeavor promised rich profits. The venture was to be headed by Prince Rupert, the King's seventeen-year old nephew, but the boy's mother objected and the project was held in abeyance.[5] The East India Company did not wish at the moment to undertake any colonial venture in Madagascar, but it regarded the proposed settlement as an invasion of its chartered rights. In the following year, Thomas Howard, the Earl of Arundel—remembered to later generations as an art collector—interested himself in Madagascar, and announced his intention of going in person to the island.[6] The King gave the proposal his blessing and John Bond was appointed captain-general. The East India Company discreetly resisted participation in these schemes. Courteen's Association, of course, favored the plan, which promised to curtail the power of its great rival. Hamond's *Paradox* was written to stimulate interest in the expedition. Unfortunately, nothing came of the plans.

Late in 1642, Bond revived interest in the colony and received the King's authority to proceed, but on complaint of the East India Company, the

[4] See William Foster's introduction to Ethel Bruce Sainsbury's *A Calendar of the Court Minutes, etc., of the East India Company, 1635–1639* (Oxford, 1907), xv–xvi.

[5] *Ibid.*, xxiii.

[6] *Ibid.*, xxvii–xxviii.

project was referred to the House of Common's Committee of Trade. On February 13, 1643, Parliament granted Bond permission to sail provided he guaranteed to do no harm to the interests of the East India Company.[7] And for the second time Hamond wrote a book to excite public interest in the colonization of the island. The tract was entitled *Madagascar, The Richest And most Fruitfull Island in the World. Wherein The Temperature of the Clymate, the Nature of the Inhabitants, the Commodities of the Countrie, and the facility and benefit of a Plantation by our people there, are compendiously and truely described. Dedicated To the Honourable Iohn Bond, Governour of the Island, whose proceeding is Authorized for this Expedition, both by the King and Parliament* (1643). Nicholas Bourne was the publisher. After many delays a fleet organized by the Courteen group took out a colony of 145 men, women, and children, and in March, 1645, landed them at St. Augustine's Bay. The settlement endured for a little more than a year and departed, leaving eighty dead in Madagascar.[8] About the time of the disconsolate settlers' removal from the island, a third book picturing Madagascar as an earthly paradise was published in England; it was the work of Richard Boothby, merchant, a man with a definite grudge against the East India Company, and was entitled *A Briefe Discovery or Description Of the most Famous Island of Madagascar or St. Laurence in Asia neare unto East-India* (1646). Boothby's book, dedicated to the King and Parliament, was clearly intended to advance the schemes of the East India Company's rivals. The work had been planned for publication in August, 1644—in time to induce settlers to volunteer for the expedition—but Boothby complains that printing was delayed by a captious licenser who objected to "the rudeness of the style and my placing Madagascar in Asia, which he would needs have to be in Africa."[9]

So displeased was the East India Company with the publicity of Hamond and Boothby that it gave a reward of £5 to Paul Waldegrave for printing an *Answer to Mr. Boothbies Book of the Description of the Island of Madagascar* (1649).[10] Waldegrave had been one of the first settlers and was bitter with disillusionment over the quality of Hamond's noble savages and Boothby's Asiatic paradise.

The first English occupation of Madagascar ended in failure, but Walter Hamond's *Paradox,* which sought to advance the settlement, deserves at least brief mention in the history of ideas as an early English statement of the virtues of primitive society as opposed to civilized life. More than a century before Hawkesworth dressed up the narratives of exploration in the

[7] Sainsbury, *A Calendar . . . 1640–1643* (Oxford, 1909), xxviii.

[8] Sainsbury, *A Calendar . . . 1644–1649* (Oxford, 1912), vi.

[9] Boothby, *A Breife Discovery* (1646), preface to the reader. I have modernized spelling and punctuation in quotations in this essay. Titles have been reproduced in the original spelling.

[10] Sainsbury, *A Calendar . . . 1644–1649,* 327. I have not seen a copy of Waldegrave's book.

South Seas and idealized the Polynesians, Hamond attributed similar ideal qualities to a kindred people. Moreover, his observations on clothes and nakedness make an interesting anticipation of Thomas Carlyle's clothes philosophy in *Sartor Resartus.*

After one contradictory note in the descriptive first portion of the *Paradox* in which he depicts the Madagascans as "a sluggish and slothfull people" who need not labor for their livelihood, Hamond proceeds to justify their existence and contrast it with the less happy life led by Englishmen. The Madagascans exhibit "barbarism civilized." Hamond's party, remaining on the island four months, found the people "very affable, courteous, and just in their dealings."[11]

The significant second part of the tract presents the arguments of the paradox. The author proposes a rhetorical question: "Will you take upon you to prefer this poor, naked, and simple ignorant people before the rich, gallant, understanding men of Europe? These are naked; we are clothed. These are poor and miserable; we are rich and wealthy. These are simple innocents; we have hearing and experience of many things wherein they are altogether ignorant."[12] The remainder of the essay is an affirmative answer to this question.

First of all the author defends the Madagascans' nakedness. Earlier he had observed that their dress was "but little differing from Adam's in his innocency, for both men and women go naked, as a token and conscientious check of deformity by sin."[13] Now he elaborates upon this theme. The Madagascans in their nakedness are happy "as approaching nearest to the greatest perfection of mankind." God had decreed clothes only to hide sinful Adam, as a painter or sculptor might cover a picture or statue in which he had discovered a hideous blemish. "Apparel is but like unto so many plasters and rollers [bandages] to cover our sores and deformities, or like masking suits, wherein we act, not what we are, but what we seem to be. It is the outside that deceives us, and by a juggling trick makes us take that for a brave man which is a piece of shreds, a mere thing of the tailor's fashioning."

A spruce gallant in a contemptible habit is but a miserable wretch in the world's opinion, but if the knave is dressed up in damask and embroideries, with spurs on his heels, a sword by his side, and a feather in his hat, "every man is ready to adore him." "And all this while we reverence nothing but a suit of clothes, which these happy people, happy in this want, judiciously contemn." Apparel to the Madagascans is a burden, a very disease that would "make them dull, heavy, and effeminate." "We wonder at them how they can go naked; but they wonder more at us, how we can endure to go

[11] Hamond, *A Paradox* (1640), sig. B 1 v.

[12] *Ibid.*, sigs. D 2–D 2 v.

[13] *Ibid.*, sig. B 2.

packed up in a fardle of clouts sewed together. We are bound up in prison whilst they are free and at liberty. We are stifled up in our sweat and stink whilst the exhalations of their vapors offends them not. Nor doth the coldness of the air hurt their naked bodies more than it doth our naked faces. It was our evil custom that clothed us, and their innocency and freedom of nature that keeps them naked."[14]

As evidence of the Madagascans' contempt for clothes, Hamond recites the story of one of the island's governors, whom Captain Weddell presented with a suit of his own best apparel. After much persuasion the chief put on the coat but soon tore it off, as if "it had been poisoned with the blood of Nessus."[15] In contrast, Europeans make themselves poor in the struggle for clothing, robbing even the beasts of the fields of their skins and utilizing the excrements of worms—an effort that produces only "luxurious effeminacy, that hath stripped us of our natural simplicity and clothed us with the rags of dissimulation." In the opinion of learned divines, Adam was clothed with the skins of dead beasts to put him in mind of his own mortality. But the original purpose of these coverings has been forgotten, and now Europeans so prize furs and fine raiment that the income of a lordship is scarcely sufficient to clothe them. "Now [that] the tailor is become the best surveyor, Euclid might have spared his pains in geometry; he [the tailor] can measure all our lands by his yard-wand." Hamond finally concludes that the effects of this monstrous pride in apparel are "the ruin of many noble families, the decay of hospitality, the ushering in of oppression, bribery, and extortion, theft, murder, cousening and deceit, and in the end, beggary, or which is worse, a death with ignominy."[16] Not even Carlyle could write a fiercer satire on man's bondage to clothes.

In similar fashion, Hamond contrasts the islanders' happy poverty with the lust after wealth characteristic of presumably enlightened Europeans. Quoting Diogenes, the author describes the contentment of mind that follows freedom from slavery to material things. The Madagascans, with the wisdom of primitive understanding, "know that the inordinate desire of riches is the root of all mischief, a raging famisht beast that will not be satisfied, a bottomless gulf that cannot be filled, a very dropsy wherein by desire of drink a man may sooner break his bowels than quench his thirst."[17] The search for gold is a delusion, a mocking hallucination that causes merchants and seamen to suffer miseries and disasters, and even the loss of their lives, for worthless baubles. "The Golden Age, so much celebrated by ancient writers, was not called so from the estimation, or predomination, that gold had in the hearts of men," Hamond learnedly observes,[18] and he quotes "Lady Catherine," "Dowager to K. Henry 8," to the effect that prosperity

[14] *Ibid.*, sigs. D 2–D 3 v.
[15] *Ibid.*, sig. D 3 v.
[16] *Ibid.*, sigs. D 4–D 4 v.
[17] *Ibid.*, sig. E 1.
[18] *Ibid.*, sig. E 1 v.

was less desirable than adversity, "because the former was never without danger, nor the latter without comfort."[19]

The primitive simplicity of the Madagascans is infinitely superior to the sophistication of civilized men, Hamond demonstrates in a series of arguments that conclude his book. Though they are ignorant of many arts and crafts necessary to Englishmen, yet they are happy—something that cannot be said of the author's countrymen. Their houses are simple sheds, but in consequence they do not have the worry of maintenance and are free as the storks to leave when the spirit moves them; "whereas we, like so many wild beasts, can hardly be forced out of our dens except famine, sword, or fire do compel us. And then, oh, what lamentation, what exclamation, and grievous complaints do we make."[20]

Their diet is coarse but wholesome, and they are spared the pains of searching the world for spices to sauce their foods. Because their drink is plain water, they escape the dangerous effects of wine and strong liquors which "transformeth us from men to beasts." So great are the calamities that follow wine-drinking that the author does not know "whether I should bewail our own miserable condition or applaud their happy estate. Heretofore, in our country of England, all foreign wines were sold in apothecaries' shops for the relief of the sick, weak, and aged. Then physicians walked on foot for the service of God's people. But when it once came to he sold publicly in taverns, then they rode on horseback like princes, the excess of wine being a main upholder of theirs; thence proceed fevers, convulsions, epilepsies, vertigoes, lethargies, gouts, and all exotic diseases, unknown to our ancestors."[21] Hamond the surgeon is convinced that the water-drinking Madagascans approach a physical perfection unattainable by guzzling Englishmen.

Surely an ignorance of the art of navigation—a skill in which his countrymen pride themselves—is evidence of the islanders' inferiority, but Hamond warns his audience of the error of jumping to such a conclusion. Had Englishmen not learned to travel, they would have been innocent of the shortcomings and vices of their neighbors, "as our drunkenness and rudeness from the Germans, our fashions and factions from the French, our insolence from the Spaniards, our Machiavellianism from the Italians, our levity and inconstancy from the Greeks, our usury and extortion from the Jews, our atheism and impiety from the Turks and Moors, and our voluptuous luxury from the Persians and Indians." Lastly, as a marginal note informs the reader, the discovery of America was a catastrophe because it introduced the pox to Europe. Better had it been if Englishmen, like the Chinese, had not travelled or suffered any "stranger to come into their country."[22]

Returning seafarers had commented on the inferiority of the Madagas-

[19] *Ibid.*, sig. E 2 v.
[20] *Ibid.*, sig. E 4.
[21] *Ibid.*, sig F 1 v.
[22] *Ibid.*, sig. F 2.

cans' arms—merely simple wooden darts—and their ignorance of the military art. But Hamond makes clear that they have courage and fortitude, and "like the Parthians, fight flying, making their retreat as dangerous to the enemy as their first encounter." As for their lack of gunpowder and ordnance, it is a proof of happiness above other nations, for modern arms are "damnable inventions," "forged in the devil's conclave," so that if "Hercules himself, whom the poets falsely, or Sampson, whom the Scriptures truly, deliver for the strongest of men, were living in these times, a child might kill them with a pistol"—another point which Carlyle was later to emphasize. A German monk, with the help of the devil, was the first inventor of the engines of modern war, Hamond asserts, on the authority of Pareus. These weapons have been developed into "a most cursed invention," by which man heaps his malice upon his fellows. So barbarous has the world become that the inventor who can create "the most wicked, cruel, and execrable project to destroy men withal is held the most worthy to receive the greatest honor, respect, and reward. And now, if ever, it may truly be said, *Homo homini demon:* one man is a devil to another."[23]

Before making a further indictment of his own countrymen for the use of the explosive implements of war, Hamond remembers himself and hastily concludes the whole treatise: "And here I cease, not presuming to advise kings and princes (this being but a Paradox) in the use of the instrument (for I know it to be as well defensive as offensive), but magnifying the mercies of God towards this people whose simplicity hath herein made them more happy than our too dear bought knowledge hath advantaged us."[24]

Thus in Madagascar Walter Hamond discovered the Golden Age of the Greeks and anticipated the romantic glorification of primitive life by philosophers and writers of the eighteenth century. The source of the ship-surgeon's inspiration is not immediately obvious. That he was a man of education and considerable reading is evident from his work. Although he does not lard his essay with literary allusions, he makes enough references to the writers of antiquity to show that he had read the classics. The notion of the Golden Age was common enough, and it would not have taken a vast amount of imagination to equate the island that he wished to advertise with the Golden Age of classical authors, or the Earthly Paradise of later writers. He may have picked up a few suggestions from More's *Utopia,* and he may have read Montaigne's essay "Of the Cannibals," but he betrays no indebtedness. The chances are that Walter Hamond simply turned his imagination loose—like many a later promoter—and drifted into idealization of the simple Madagascans and the corollary indictment of civilization. Whatever the source, the tract is an interesting example of seventeenth-century propaganda and a readable essay on the virtues of that mythical and remarkable being—the noble savage.

The Huntington Library.

[23] *Ibid.,* sigs. F 3–F 3 v.

[24] *Ibid.,* sigs. F 3 v–F 4.

BOOKS RECEIVED

THE BIBLE IS HUMAN. A Study in Secular History. By Louis Wallis. New York: Columbia University Press, 1942. Pp. 330. $2.50—The idea of God divested of supernaturalism in the secular history of Israel and the sociological evolution of Jewish-Christian ethical monotheism.

THE CHALLENGE OF THE GREEK AND OTHER ESSAYS. By T. R. Glover. Cambridge University Press; New York: Macmillan Co., 1942. Pp. 241. $2.75.—Studies in the ancient Greek ways of living.

GREEK FOUNDATIONS OF TRADITIONAL LOGIC. By Ernst Kapp. New York: Columbia University Press, 1942. Pp. 95. $1.50.—The development of *logos* as an instrument of thought that culminated in the *Organon* and how the precise formulations of the *Analytics* emerged by successive stages; the importance of the *Topics*, its relations to the *Analytics*, and the syllogism as an instrument for the discovery of premises rather than of fresh conclusions.

THE ECLOGUES OF VERGIL. By H. J. Rose. Berkeley and Los Angeles: University of California Press, 1942. Pp. 275. $2.50.—The Sather Classical Lectures of 1939–1940.

MINOR HISTORICAL WRITINGS AND OTHER ESSAYS. By Henry Charles Lea. Edited by Arthur C. Howland. Philadelphia: University of Pennsylvania Press, 1942. Pp. ix, 414. $3.50.—Includes Lea's Witch Persecution in Transalpine Europe from the Sixteenth to Eighteenth Century, Ethical Values in History, as well as Lea's studies on the Inquisition, The Medieval Church, The Decadence of Spain, Catholicism and Politics, Is There a Roman Catholic Church?, Bible View of Polygamy, Fetishism in Politics, some book reviews, and two youthful scientific writings (on chemistry and conchology).

A HISTORY OF MODERN LIBERTY. By James Mackinnon. Vol. IV. The Struggle with the Stuarts 1647–1689. London, New York, and Toronto: Longmans, Green and Co., 1941. Pp. xiii, 523. $6.40.—The struggle in England and Scotland during the second half of the seventeenth century "is the modern foundation of the free institutions for which Great Britain stands and which have engraved themselves in British tradition and in the British spirit, and have powerfully influenced many other lands in the course of the last two centuries, particularly in the case of the British Commonwealth of Nations, the United States, and other American lands as well as those of Europe." The last two chapters treat of the "Relative Political

Thought" of James I, Rutherford, Milton, Hobbes, Harrington, Filmer, Sydney, Locke.

GEORGE WHETSTONE. By Thomas C. Izard. New York: Columbia University Press, 1942. Pp. viii, 297. $3.75.—A representative of "the important but relatively neglected period which immediately preceded the emergence of Shakespeare."

BOILEAU EN FRANCE AU 18E SIÈCLE. Par John Richardson Miller. Baltimore: The John Hopkins Press; London: Humphrey Milford Oxford University Press, 1942. Pp. 626. $5.50.—"Les opinions contradictoires émises sur lui (Boileau) à cette époque (18e siècle) sous l'influence des divers mouvements d'idées montrent la transformation lente et complexe qui mène la France du classicisme au seuil du romantisme." Part I "Boileau et le Cartésianisme Littéraire"; Part II "Boileau et les Philosophes"; Part III "Boileau et la Question du Génie"; Part IV "Boileau et la Fin du Classicisme."

BEETHOVEN IN FRANCE. The Growth of an Idea. By Leo Schrade. Connecticut: Yale University Press, 1942. Pp. 271. $3.00.—Influence of Beethoven's music in France from 1828 to Herriot's *Vie de Beethoven*, including a chapter on the growth of the romantic idea of the "lure of the infinite."

RELIGIOUS TRENDS IN ENGLISH POETRY. Volume II: 1740–1780 Religious Sentimentalism in the Age of Johnson. By Hoxie Neale Fairchild. New York: Columbia University Press, 1942. Pp. ix, 406. $5.00.—This is the second in the series of studies in which Professor Fairchild will trace the response of English poets to currents of religious thought and feeling from the beginning of the eighteenth century to the present time. Volume II carries the subject from 1740, the terminal date of Volume I, to 1780—the threshold of the Romantic Period.

ANNALS OF THE NEW YORK STAGE. Volume XIII: 1885–1888. By George C. D. Odell. New York: Columbia University Press, 1942. Pp. xviii, 723, illus. $8.75.—Volume XIII of this record of the New York stage covers three full seasons of entertainment, including sketches of John Drew and Otis Skinner, Ada Rehan, Forbes-Robertson and DeWolf Hopper, Mary Anderson, Modjeska, Dion Boucicault, Lillian Russell, Lilli Lehmann, McIntyre and Heath, Richard Mansfield, E. H. Sothern, Sarah Bernhardt, Mrs. Langtry, Maurice Barrymore, Weber and Fields, Julia Marlowe, Henry Irving, Ellen Terry, Fanny Davenport, and Lew Dockstader, accompanied by 45 pages of photographs and 115 pages of Index, containing 27,552 references.

THOMAS MANN'S WORLD. By Joseph Gerard Brennan. New York: Columbia University Press, 1942. Pp. xvii, 206. $2.50.—A general study of Thomas Mann's work, political and nonpolitical, although it dwells particularly on the long history of creative development that culminates in "The Magic Mountain."

TWO CURRENTS IN THE THOUGHT STREAM OF EUROPE. A History of Opposing Points of View. By Elmer G. Suhr. Baltimore: The John Hopkins Press, 1942. Pp. 469. $5.00.—The "absolutist" and the "broad intellectual" points of view in cultural history are postulated in an analysis of ancient, medieval and modern art, philosophy, and government.

THE MORAL IDEALS OF OUR CIVILIZATION. By Radoslav A. Tsanoff. New York: E. P. Dutton & Co., 1942. Pp. 636. $5.00.—The moral ideals of Western culture in the works of philosophers, poets, saints and social reformers since classical antiquity.

GLIMPSES OF WORLD HISTORY. Being Further Letters to His Daughter Written in Prison, and Containing a Rambling Account of History for Young People. By Jawaharlal Nehru. With 50 maps by J. F. Horrabin. New York: The John Day Co., 1942. Pp. xvi, 993. $4.00.—The letters were written between October 1930 and August 1933 in the style of Wells' *Outlines*. The postscript ends with news of the Nazi subjection of Czechoslovakia.

MAN'S MOST DANGEROUS MYTH: The Fallacy of Race. By M. F. Ashley-Montagu. With a Foreward by Aldous Huxley. New York: Columbia University Press, 1942. Pp. xiii, 216. $2.25.—"It has been well said that there is no domain where the sciences, philosophy and politics blend to so great an extent and in their contact have so great an importance to the man of the present day and of the future as in modern 'race' theory."

THE GUILT OF THE GERMAN ARMY. By Hans Ernest Fried. New York: The Macmillan Co., 1942. Pp. 426. $3.20.—Part One "Militarist Roots of National Socialism" claims that the Nazi Party was the agent which delivered the German nation to the Army.

THE PRINCIPLE OF POWER. The Great Political Crises of History. By Guglielmo Ferrero. Translated by Theodore R. Jaeckel. New York: G. P. Putnam's Sons, 1942. Pp. 333. $3.50.—Parallels are drawn between the "illegitimate governments" of the past and the revolutionary factors in the outbreak of World War II.

GEOPOLITIK. Doctrine of National Self-Sufficiency and Empire. By Johannes Mattern. Baltimore: The John Hopkins Press, 1942.

DEMOCRATIC IDEALS AND REALITY. A Study in the Politics of Reconstruction. By the Right Honourable Sir Halford J. Mackinder. Introduction by E. M. Earle. Foreword by Major George Fielding Eliot. New York: Henry Holt and Co., 1942. Pp. 219. $1.90.—A reissue of the 1919 edition which was utilized by General Haushofer and other German geo-politicians.

VIRGINIA IS A STATE OF MIND. By Virginia Moore. New York: E. P. Dutton and Co., 1942. Pp. 332. $3.00.—Celebrated natives of the state from Jamestown's founding to the present day, and their contribution to American cultural life.

THE MAD FORTIES. By Grace Adams and Edward Hutter. New York and London: Harper and Brothers, 1942. Pp. 294. $2.50.—American ideas in the 1840's among the credulous followers of phrenology, homeopathy, spiritualism, interplanetary speculation, abolitionism, anti-rent, etc.

MAN AND SOCIETY IN CALAMITY. By Pitirim A. Sorokin. New York: E. P. Dutton and Co., 1942. Pp. 352. $3.00.—The typical effects of war, revolution, famine, pestilence upon human mind, behavior, social organization and cultural life.

THE AGE OF ENTERPRISE. A Social History of Industrial America. By Thomas C. Cochran and William Miller. New York: Macmillan Co., 1942. Pp. 394. $3.50.—"Enormous amounts of research yet remain to be done in the relation of business to religion, education, ethics, and creative arts in the United States, as well as to charity and philosophy."

A DIPLOMATIC HISTORY OF THE UNITED STATES. By Samuel Flagg Bemis. Revised Edition. New York: Henry Holt and Co., 1942. Pp. 933. $4.00. —Chapters have been added to bring the first edition up to Jan. 1, 1942, "that is, to Pearl Harbor and the United Nations, leaving the Conclusion to Time, the Great Expositor."

THE THEORY OF CAPITALIST DEVELOPMENT. Principles of Marxian Political Economy. By Paul M. Sweezy. New York: Oxford University Press, 1942. Pp. 398. $4.00.—"Starting from the most abstract problem of Political Economy—the theory of value—and proceeding by successive stages to the pressing problems of present-day world society," the book concludes with chapters on world-economy, Imperialism, Fascism, The Prospects of Liberal Capitalist Reform and the Decline of World Capitalism from a Marxian Standpoint.

THE FUTURE OF INDUSTRIAL MAN. A Conservative Approach. By Peter F. Drucker. New York: The John Day Co., 1942. Pp. 298. $2.50.—At-

tacks rationalist Liberalism as totalitarian: "The fathers and grandfathers of Hitlerism are not medieval feudalism or nineteenth-century romanticism but Bentham and Condorcet, the orthodox economists, and the liberal constitutionalists, Darwin, Freud, and the Behaviorists" (p. 191).

THE EDGE OF THE ABYSS. By Alfred Noyes. New York: E. P. Dutton & Co., 1942. Pp. 172. $2.00.—An attack on the increasing power of the State over the rights, privileges, person of the individual citizen.

PHILOSOPHICAL ESSAYS IN HONOR OF EDGAR ARTHUR SINGER, JR. Edited by F. P. Clarke and M. C. Nahm. Philadelphia: University of Pennsylvania Press, 1942. Pp. viii, 377. $3.50.—On the Criteria and Limits of Meaning, A. O. Lovejoy; The Development of the Experimental Method, H. Jaffe; Fantasia in Plotinus, G. H. Clark; Kant and Thomas Aquinas on the Proofs for the Existence of God, F. P. Clarke; The Categories of Aristotle, J. Husik; Newton's Natural Philosophy: Its Problems and Consequences, J. H. Randall, Jr.; David Hume's Contribution to Social Science, Wilson D. Wallis.

MEN OF TOMORROW. Nine Leaders Discuss the Problems of Youth. Edited with a Prefatory Notes by Thomas H. Johnson. Introduction by Allan V. Huly. New York: G. P. Putnam's Sons, 1942. Pp. 247. $2.00.—The Lawrenceville School Forum lectures of July, 1942, by Samuel E. Morison, Germany and America 1492–1942; Robert H. Jackson, Statecraft Under a Written Constitution; Herbert Agar, America's Responsibility in World History; Reinhold Niebuhr, The Rôle of Prophetic Religion in the World Crisis; James P. Baxter, 3rd, Education in Wartime in a Democracy; John Erskine, Literature and the Arts; Earnest A. Hooton, Science and Youth; Arthur Krock, A Free Press in War Time; Pearl Buck, Manners and Civilization.

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